the OIL AND GAS JOURNAL

THE "OILWELL" STORY

90 Years of Progress

OIL WELL SUPPLY
DIVISION
UNITED STATES STEEL COMPANY

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AND PAGES 110 to 173

PRICE 50 CENTS

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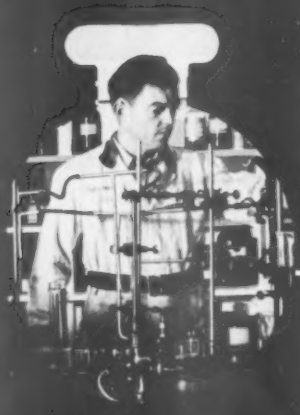
MAY 26, 1952

SCIENTIAL



PRODUCING KNOWLEDGE
FOR THE OIL INDUSTRY

HALLIBURTON

High main bearing capacity

An Extra in Bethlehem Swivels at No Extra Cost

The only way to learn the *true rating* of a swivel is to check the main-bearing capacity. This rating is not always expressed by the manufacturer's symbol, the symbol he uses for catalog purposes.

Example: one of Bethlehem's most popular swivels is known as the 150TA. This "150" does *not* mean the rating of the swivel. Actually, the main bearing has a capacity of 170 tons at 100 rpm.

That's important. It's important to check the main bearing of any swivel before you buy. Otherwise, you may purchase a unit designated as "300 tons," only to find that the main-bearing capacity is as low as 150 tons at 100 rpm.

Each of the four Bethlehem swivels has high bearing capacity; high, that is, with relation to the size of the swivel. But there are other standout features, too—among them the double-life washpipe. By means of an ingenious device, the pipe can be locked at the top, so that the wear takes place at the bottom; or it can be locked at the bottom so that the wear takes place at the top. Thus the wear on both washpipe and packing can be divided, and the life of these parts prolonged—meaning *a big saving of costly shutdown time.*

There's a Bethlehem swivel for every drilling assignment, shallow or deep. Ask for full details, which will be furnished promptly.

FOUR SIZES OF BETHLEHEM SWIVELS

Catalog Number	Main bearing cap., 100 rpm
60TA	64 tons
100TA	123 tons
150TA	170 tons
300TA	302 tons

In addition to its manufacturing plants and its sales and engineering service, Bethlehem Supply Company maintains stores throughout the Rocky Mountain, Midcontinent, Southwestern, and California oil fields. There are almost 50 of these modern, up-to-the-minute stores, all fully stocked to meet local day-by-day requirements.

BETHLEHEM SUPPLY COMPANY

General Offices: 21 E. Second St., Tulsa, Okla.
West Coast Headquarters: Los Angeles, Calif.
Export Distributor: Bethlehem Steel Export Corporation
25 Broadway, New York, N. Y.
Canadian Representative: Rocky Mountain Supply Co., Ltd., Calgary, Alberta

BETHLEHEM STEEL

MOTOROLA'S
...Thousands of Miles of Working Microwave Circuits

Nearly 50,000 circuit miles of Microwave channels working around the clock carrying voice, teleprint, telemeter, with provisions for full supervisory control.

Point-to-point integration of system-wide communications! That's the picture of Motorola Microwave systems now in and working reliably, economically.

Twice as many Motorola 2-way radios serve police, fire, defense and industrial organizations as all others combined — and now Motorola Microwave has established an early lead with 27 customer-satisfying installations in and working — including the first two 1000-mile systems of private-owned industrial Microwave.

27 Systems In and Working
— Saving Time and Cost for the Owners —
Can Do The Same For You In Your Operation!

- 2-way radio hookup
- Voice
- Teleprinter
- Telemeter
- Control Readings

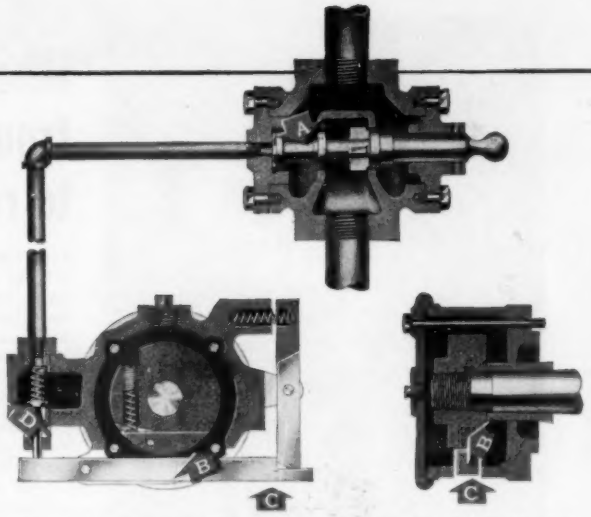
Mid Valley Pipeline Company (1000 miles)
Texas Illinois Natural Gas Pipeline Co. (1000 miles)
Aeronautical Radio, Inc. (air-ground radio control)
Hawaiian Air Lines (air-ground control)
City of Dayton
Shell Pipeline Co. (2nd year)
Panhandle Eastern Pipeline Company (telemetering)
Pan American Pipeline Co. (with private wire-line tie-in)
Michigan State Police (with remote V.H.F. control)
State of California

Motorola Microwave
Communication and Electronics Division
4545 AUGUSTA BLVD., CHICAGO 51, ILLINOIS
In Canada: Rogers Majestic Electronics, Ltd., Toronto, Canada

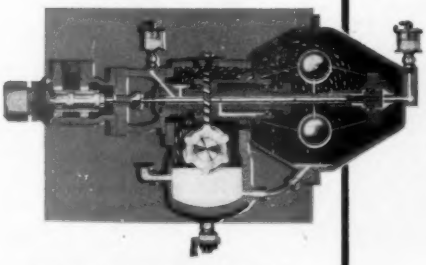
WRITE MOTOROLA MICROWAVE—4545 AUGUSTA BLVD., CHICAGO 51, ILLINOIS

The Oil and Gas Journal, published Mondays, copyright 1952, by The Petroleum Publishing Company. Entered as second-class matter September 1, 1910, at post office at Tulsa, Okla., under act of March 3, 1879. U. S. and foreign rates to the petroleum industry, $4 yearly.

Only Coppus Turbines offer you *a pilot operated* excess speed safety trip



The constant speed governor on Coppus Turbines, plus this Excess Speed Safety Trip, gives you extra protection for your turbine investments. Here's how it works. When steam is turned on, pressure opens valve A fully. When excess speed is reached, centrifugal force throws weight B against lever C lifting pilot valve D. This releases pressure in back of valve A, closing this valve instantaneously, to shut off the steam. Safety trip can be tested easily while turbine is running by manually tripping and resetting lever C.



Sectional view showing lubricating system of fully enclosed Coppus Constant Speed Governor. Governor head acts directly on stem of steam admission valve. No external levers required. Ball bearing construction eliminates end play and gives frictionless operation.

Coppus Turbines ranging from 150 hp down to fractional in 6 frame sizes

CUT YOUR COSTS PER HORSEPOWER

When you choose from the Coppus Steam Turbine line, you get the right size for your requirements . . . and make substantial savings on *any* size from the 150 hp turbine down to the smallest. Low in first cost, Coppus Turbines save you more money in the long run. Operating and maintenance costs are kept low by such other features as: large number of steam nozzles, controlled individually by manually operated valves; hard chromium plating on shaft at the stuffing box; replaceable cartridge type bearing housings; optional carbon ring packing assembly for back pressures up to 75 pounds.

WRITE FOR BULLETIN 135

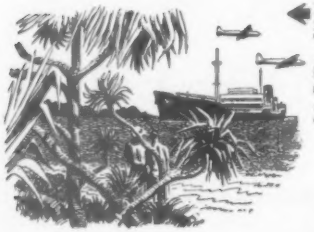
COPPUS ENGINEERING CORPORATION, 266 Park Ave., Worcester 2, Mass. Sales offices in THOMAS' REGISTER.

COPPUS "BLUE RIBBON" TURBINES

"What does it take from an oil company to run an airlift?"

Ever since mid-summer of 1950, military activity in Korea *has called for heavy trans-pacific air traffic by civilian cargo planes. Over one of their routes they fly a round trip of 13,450 miles—some 26 times the length of the famous Berlin airlift. Hundreds of companies help supply this operation. Maybe you'd like to know what it takes from an oil company to run an airlift.*

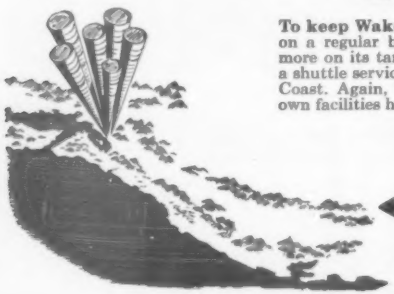
Standard's part in the Pacific airlift shows that it's a big help to have large companies on hand when the going gets rough. Our work is focused mainly at Wake Island, that pinpoint some 4000 miles from the U. S. West Coast. After World War II, Wake was a refueling stop for commercial airliners en route to the Orient. But then came the struggle at the 38th parallel—



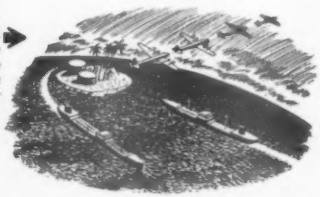
Before trouble kindled in Korea, only 20 planes a week refueled at Wake Island. Then that number multiplied many times —calling for more gas *fast*. We'd been serving the island; when the U. S. asked us to step up deliveries, we were able to do it. As a big, integrated company, we called on our own tanker fleet.

As air activity stepped up even more, Wake needed larger ground crews. Standard's bigness helped again. Using facilities in Honolulu, we quickly trained men to handle high-octane gas, tripled our manpower on Wake.

To secure the special loading equipment needed by the ground crews, a Standard ship picked up the nearest available—at far-off Canton Island. And at U. S. request, we helped build new storage facilities at Wake.



To keep Wake and the airlift supplied on a regular basis, Standard drew once more on its tanker fleet. We now operate a shuttle service to Wake from the Pacific Coast. Again, being big and having our own facilities helps us serve.



Of course, the transpacific airlift starts in America, and at home on this end of the route Standard keeps some 10 airlines supplied with aviation gasoline. It would take a stack of drums *a mile high* to hold our increased daily output for this use. At the same time, we're also supplying military needs . . . and our usual volume for motorists.

STANDARD OIL COMPANY OF CALIFORNIA

• plans ahead to serve you better

BRONZE "QUICK-FLO" QUICK OPERATING LEVER GATE VALVE

BRONZE QUICK OPERATING LEVER GATE VALVES

Fig. 130—100 lbs. W.S.P. 150 lbs. W.O.G. ½" to 4"

Fig. 131—200 lbs. W.S.P. 300 lbs. W.O.G. ½" to 3"

Fig. 736—125 lbs. W.S.P., 200 lbs. W.O.G. ⅜ to 3". Also listed as standard by Underwriters' Laboratories. Approved by Factory Mutual Laboratories for use on devices handling gasoline, naphtha, fuel oil, etc. at a maximum working pressure of 50 lbs. Be sure to specify service.

Fig. 835—125 lbs. W.S.P. 200 lbs. W.O.G. ⅜" to 3". Approved by Factory Mutual Laboratories for the handling of gasoline, lacquer thinners, and similar liquids at a maximum working pressure of 50 lbs. Be sure to specify service.

Fig. 328 — Iron Body Bronze Mounted. 125 lbs. W.S.P., 175 lbs. W.O.G.—1 to 4" inc. 100 lbs. W.S.P., 150 lbs. W.O.G.—5–6"

Fig. 231—All Iron 125 lbs. W.S.P., 175 lbs. W.O.G.—1 to 4" inc. 100 lbs. W.S.P., 150 lbs. W.O.G.—5–6"

BRONZE "QUICK-FLO" SELF CLOSING LEVER GATE VALVE

IRON BODY QUICK OPERATING LEVER GATE VALVES

Fig. 132—Iron Body Bronze Mounted. 175 lbs. W.S.P., 250 lbs. W.O.G.—2 to 4" inc. 150 lbs. W.S.P., 200 lbs. W.O.G. 5–6"

Which of these 7 QUICK OPERATING VALVES fits your needs

D. T. Williams offers you a complete line—from general purpose types to those that are self-closing, Underwriters' Laboratories listed or Factory Mutual approved. All are faultlessly engineered, quick and dependable in operation!

See your nearest jobber or write for literature.

GUARDIANS OF THE PIPELINES
D.T. Williams VALVES

THE D. T. WILLIAMS VALVE CO.
Founded 1904
Division of *The Schaible Company*
SUMMER STREET • CINCINNATI 4, OHIO

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Our oil and gas supply salesmen are combination salesmen and "trouble-shooters." They specialize in finding "hard-to-get" items and getting them delivered while they're still needed. If we can't get your order to you via rail, boat, plane or truck, one of our salesmen will load up his car and beat a trail to your location. That's SUPERIOR SERVICE!

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- Lafayette, La.
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- Stephens, Ark.
- Camden, Ark.
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- Dallas, Texas
- Abilene, Texas
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New York City — Room 1212, 502 Park Ave. — Telephone El Dorado 5-3572

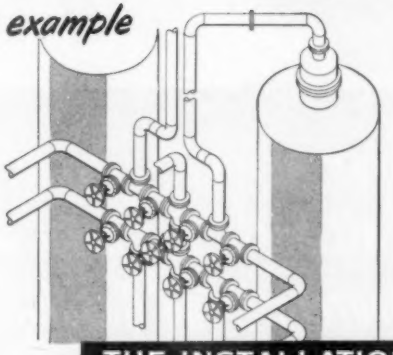
SUPERIOR IRON WORKS & SUPPLY COMPANY, INC.

GENERAL OFFICE: 1202-04 MARSHALL • P.O. BOX 1800 • SHREVEPORT, LOUISIANA

Are You Getting Valve Satisfaction?

Like this Refinery

for example



THE INSTALLATION

Nine Crane valves on control manifold to reaction chambers on Perco Cycloversion Unit. Bareco Oil Company, Wichita, Kansas.

VALVE SERVICE RATINGS

SUITABILITY:	Matches service needs
MAINTENANCE COST:	None to date
CORROSION-RESISTANCE:	O.K.
SERVICE LIFE:	Now more than 2 yrs.
OPERATING RESULTS:	Valve leakage stopped
PRICE:	In line
AVAILABILITY:	Local Crane Supplier

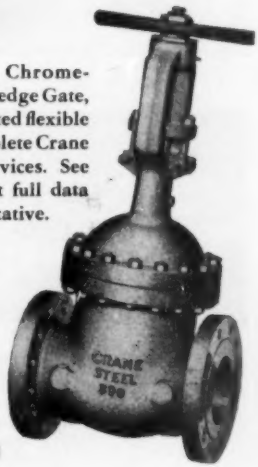
THE HISTORY

Valves formerly used would not stay absolutely tight as necessary. Down time for repairs was excessive. Fluids handled: At oil inlet, straight run gasoline at 950 Deg. F., 85 psi; for catalyst regeneration, air-steam mixture at 850 Deg. F., 15 psi; regeneration waste gases, 1200 Deg. F. at 5 psi. Approximately 15-day cyclic operation.

Replacement made with Crane Valves. After more than 2 years' service, with no maintenance required, all Crane Valves are absolutely tight and operating at highest efficiency.

THE VALVE

Crane 300-Pound No. 5 Chrome-Molybdenum Alloy Steel Wedge Gate, with Stellite seats and patented flexible disc design. One of the complete Crane steel family for refinery services. See your Crane Catalog or get full data from your Crane Representative.



The Complete Crane Line Meets All Valve Needs. That's Why,

More Crane Valves Are Used Than Any Other Make!

CRANE VALVES

CRANE CO., *General Offices:* 836 S. Michigan Ave., Chicago 5, Illinois

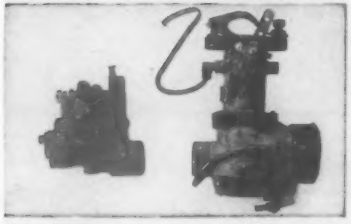
Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING • HEATING

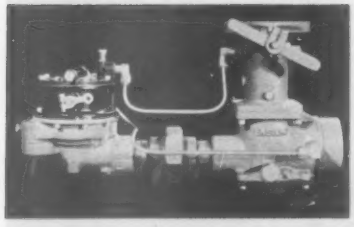
How to make 'em Last Longer

Ensign parts available for all Early Models of Gas Carburetors and Regulators

Before



After



In keeping with the CONSERVATION order of the day, here's how you can stretch out the useful life of your carburetor equipment.

1. Keep air cleaner to carburetor connections tight. A dust leak wears out carburetor shafts, bushings, and engines.
2. Check engines for loose mounting bolts. Vibration causes excessive wear on all parts and accessories.
3. Replace any worn carburetor and regulator parts; diaphragms, shafts, valves, seats, gaskets, etc.
4. Request ENSIGN Service Bulletins covering the ENSIGN equipment on your engine.

ENSIGN Carburetors are built to out-last the engines on which they are installed. A reasonable amount of preventative maintenance will help both carburetor and engine to render long uninterrupted service.

ENSIGN

CARBURETOR COMPANY

When requesting ENSIGN Service Bulletins, please specify make and model of engine on which carburetor is installed. Also, fuels used.

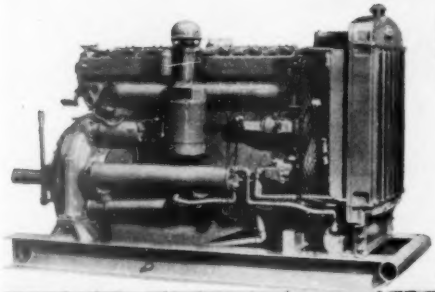
7010 South Alameda St., Huntington Park, Calif. • 2330 West 58th St., Chicago 36, Illinois

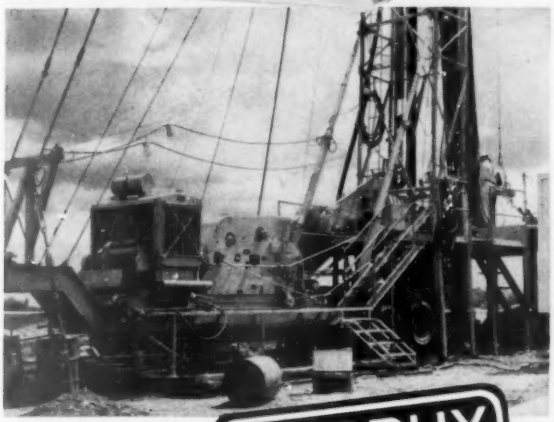
Here's why

MURPHY DIESELS

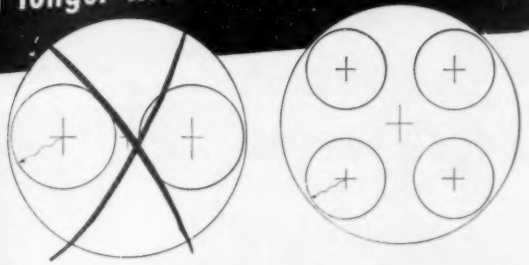
put more power into your job

with longer life and less maintenance





Cardwell Model L Trailer-mast servicing unit owned by Redwell Servicing Co., Edmonton, Alberta, Canada. It is powered by a Murphy Diesel rated at 125 H.P. continuous 140 H.P., intermittent.



THE power a diesel engine develops is dependent to a great degree on the breathing capacity of the valves. Breathing capacity of the valves in turn is determined by the circumference of the valves and their lift. Thus, when we compare Murphy Diesel's 4 valve design with the conventional 2 valve design of equal total valve area, simple arithmetic shows that total circumference of the 4 valve arrangement is 41.4% greater. With equal lift, the breathing capacity is also 41.4% greater.

At the same time, Murphy design provides 41.4% more metal-to-metal contact between the circumference of the valve and the seat for dissipation of valve heat. This, coupled with the smaller valve radius in 4 valve design (which means the heat has a shorter distance to travel to escape), explains why Murphy valves run cooler and rarely, if ever, have to be ground.

Four valves per cylinder is just one of the many reasons for Murphy's high standards of performance and economy. Others are given in the booklet "10 Questions to Ask a Diesel Engine Salesman". Get a copy from your Murphy Diesel Dealer or write direct.

MURPHY DIESEL

Heavy duty power

for the oilfields

Murphy Diesel Engines and Power Units for drilling and pipe line pumping, 90 to 226 H.P., 1200 and 1400 RPM. Generator Sets, 60 to 140 K.W. Dual-Fuel Engines, 135 to 180 H.P. Also Crude Oil Burning Engines.

222

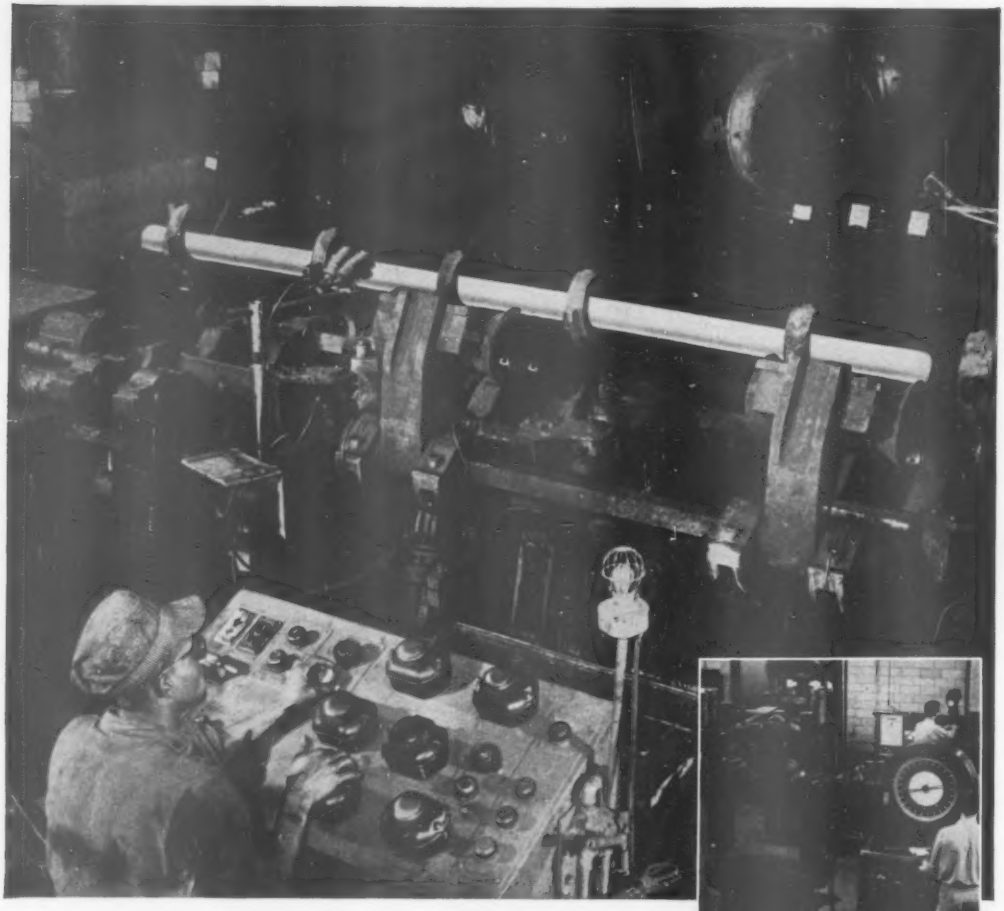
MURPHY DIESEL COMPANY

5305 W. Burnham St. Milwaukee 14, Wisconsin

FACTORY BRANCH Sales, Parts, Service:
113-117 South Elwood Street, Tulsa, Oklahoma

Sales, Parts and Service: Los Angeles and Bakersfield, California; Denver, Colorado; Evansville, Indiana; Great Bend, Kansas; Monroe and New Orleans, Louisiana; Butte and Great Falls, Montana; Albuquerque, New Mexico; Amarillo, Dallas, Houston, Lubbock and San Antonio, Texas; and Edmonton, Alberta, Canada.

Specify GLOBE for the finest steel tubes



Globe's Physical Testing Laboratory — one of the seven different research and testing labs in Globe's House of Science.

Specialized research, engineering and production assure uniform high-quality STEEL TUBES

AT Globe, specialization is the keynote. Men, machines, and raw materials are all tailored to fit the Globe *specialized* process. Precision checks — and rechecks — at every stage of production insure Globe Tubes that meet *your* exacting specifications.

Be sure! Specify dependable, high-quality Globe Steel Tubes and be certain of getting the finest tubes available. Write for the General Catalog and become acquainted with Globe *specialized* process.

GLOBE STEEL TUBES CO., Milwaukee 46, Wisconsin

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GLOBE TUBES

GLOBE STEEL TUBES ARE AVAILABLE IN:

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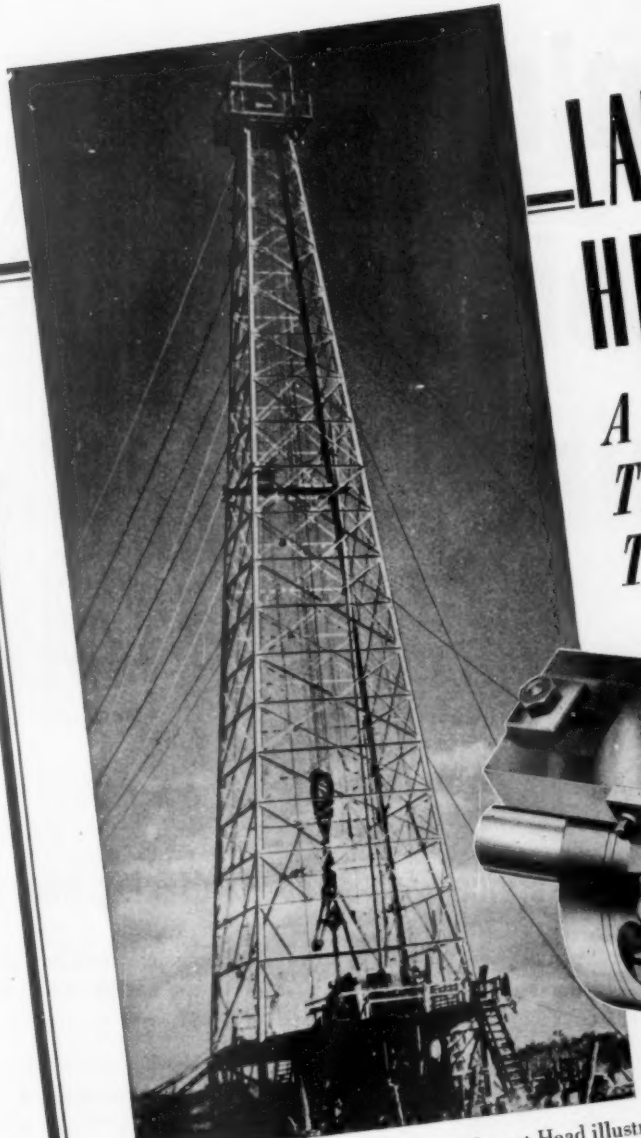
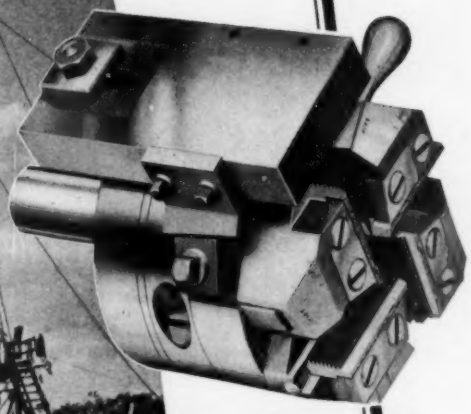
LANDMATIC HEADS *for* ACCURATE TAPERED THREADS





● The 2" LANDMATIC Taper Attachment Head illustrated is widely used in the production of oil tubular goods. It is designed primarily to cut taper threads to exacting A.P.I. standards. The Taper Attachment by limiting cutting action to the throat section of the chaser reduces chaser wear and increases thread accuracy. *Write for Bulletin F-90.*

LANDIS MACHINE CO.
WAYNESBORO, PA., U. S. A.

Represented in the Domestic Oil Fields by: Colcord-Wright Machinery & Supply Co., St. Louis, Mo.; C. J. Harter Machinery, Houston, Texas; Frederic-Baker Co., New Orleans, La.; Moore Machinery Co., Los Angeles and San Francisco, Calif.; Hendrie & Bolthoff Mfg. & Supply Co., Denver, Colo.

keeping a tool joint "jumping"

for twice the usual service with Airco Hardfacing Alloys

Tool joint killers: Increased drilling depths — higher penetration rates—faster rotating speeds — these are the factors that add dollars to drilling and maintenance costs.

Unless — Airco Hardfacing Alloys are given the job of holding expenses to a minimum. For with these shock and abrasion-resistant alloys you may double your tool joint life—even under the toughest drilling conditions.

And of extra importance: Not only is wear greatly reduced but correct box end diameters are maintained.

If you're being faced today with tool joint problems, there's an Airco representative near you who can help. Just write or phone your local office for the information you need.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND

AN AIR REDUCTION PRODUCT

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Half-ton or Multi-ton

... every truck service need is met by Spicer Universal Joint Design

Speedy, light-delivery jobs...or dead-weight tonnage involving the world's heaviest loads...every extreme and type of truck service requirement is met by adequate engineering design in Spicer flange- and yoke-type models.

- Sliding splines have ground finish on ALL contact surfaces, extra hardness, and iron manganese phosphate coating.
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- Precision bearings with improved surface hardness and finish.
- Dynamically balanced to exacting limits.
- Uniform high quality propeller shaft tubing. *Steel meets our special specifications.*
- Wide selection of flange and yoke types and sizes to suit each individual requirement.

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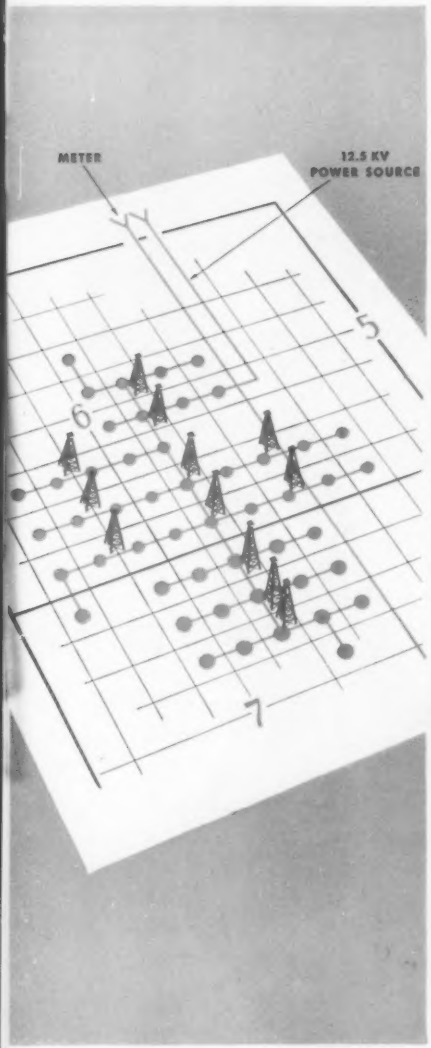
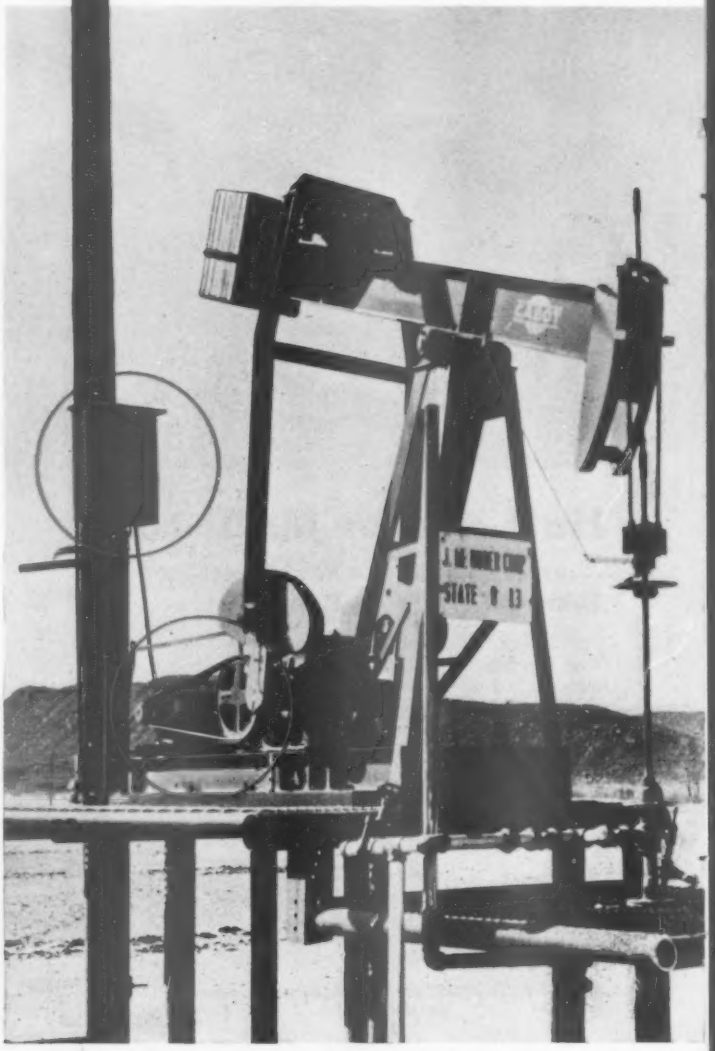
They did what you can do to reduce costs



Cost of the complete power line for these 49 Oklahoma wells was only $378 per well. Pumping cost is only 4.1c per bbl.



This Westinghouse-equipped pumping rig operates in *blowing sand* in a dry river bed. However, it has given 100% performance!

An opportunity for major cost savings in petroleum production

Have you really studied the dollar and cents advantages of electrified pumping? Look at these two examples from the Westinghouse files.

Operates under severe conditions

The photo at left shows a rig mounted on stilts in a dry river bed in Texas. The service conditions are terrible—sand blows constantly except during the rainy season when the river bed floods. Yet the Westinghouse motor and automatic time control have given 100% performance since they were installed two years ago. They haven't even required contact replacement. The automatic control cuts the motor in and out as desired, with just a rare check by the pumper.

Pumps 49 wells for only 4.1c per bbl

But you don't have to have unusually severe conditions to make electrified pumping pay. A study of 49 wells in the Healdton field in Oklahoma, shows pumping costs of *only 4.1c per bbl.* Westinghouse automatic time control staggers the pumping load so that power load is just 47% of total connected load. The whole 49 wells are handled by one combination pumper-electrician. And the installed cost of the power line was only $378 per well, including transformers.

Call Westinghouse for planning help

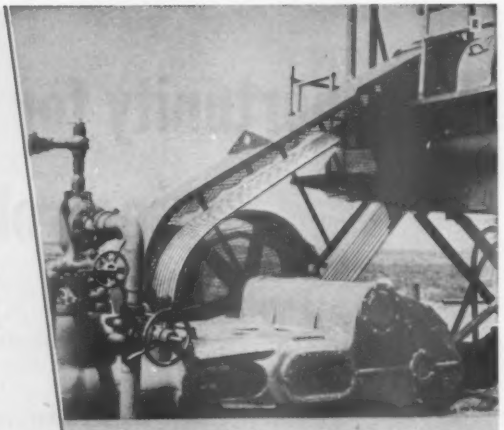
Determining the best pumping method over the long run requires a careful economic analysis. It's a costly mistake to select equipment simply on the basis of what is easiest or cheapest to set up initially. Westinghouse would like to help you make the type of study that will show whether *you* can make major cost savings in your petroleum production. Call us in.

DO YOU HAVE YOUR COPY of this valuable guide on oil well pumping? Write for B-4039, "Electrified Oil Well Pumping," Westinghouse Electric Corp., P.O. Box 868, Pittsburgh 30, Pa.
J-94908

YOU CAN BE SURE...IF IT'S
Westinghouse

EQUIPMENT FOR THE PETROLEUM INDUSTRY

Prove for yourself why Gates Vulco Ropes are giving you longer V-Belt Wear!



The fastest well ever drilled in Scurry County, Texas—Texas Co. No. 154 P. L. Fuller—was completed by Parker Drilling Co. in 19 days, 8½ hours. Usual time required in this area is 30 days. Gates Vulco Ropes drove mud pump of the drilling rig.

There is a very simple reason why Gates Vulco Ropes—the V-belts built with *concave sides*—are giving you substantially *longer wear*—and you can easily prove this for yourself in just 2 minutes' time!

Pick up *any* V-belt whatever and bend it as it bends when going around a pulley. As the V-belt bends, grip its sides with your fingers—and here is what will happen, every time.

If the belt you are bending is a *straight-sided* V-belt, you can *feel* its sides *bulge out* as the belt bends. This out-bulge forces the sides of the belt to press *unevenly* against the V-pulley—as shown in figure 1-A (see accompanying diagrams).

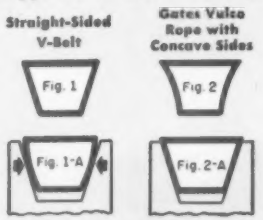
Clearly, this *uneven pressure* against the V-pulley causes the belt to wear *unevenly*—with the wear *concentrated* where the bulge is greatest—and this concentrated wear at one point naturally shortens the life of a *straight-sided* V-belt.

Now, make this same test with the belt that is built with Concave Sides—the Gates Vulco Rope!

Whereas you felt an *out-bulge* when you bent a belt with straight sides, you find that the *Concave Sides* merely fill out and become *perfectly straight*. The sides therefore *press evenly* against the V-Pulley. This distributes the wear *uniformly* across the *full width* of the belt. Naturally, this means longer belt life and *lower* belt *costs* for you!

Only V-Belts made by Gates are built with concave sides. Whenever you buy V-Belts, be sure that you get the V-Belt with the Concave Sides—The Gates Vulco Rope!

What Happens When a V-Belt Bends



How Straight-Sided V-Belt Bulges in Sheave -Groove. Sides Press Unevenly Against V-Pulley Causing Extra Wear At Point Shown by Arrows.

The Concave Sides Fill out to a Precise Fit in the Sheave Groove. No Side Bulge! Sides Press Evenly Against the V-Pulley—Uniform Wear—Longer Life!

CS-5110

Gates® Hose V-Belts Molded Rubber Goods for Industry

VULCO ROPE DRIVES

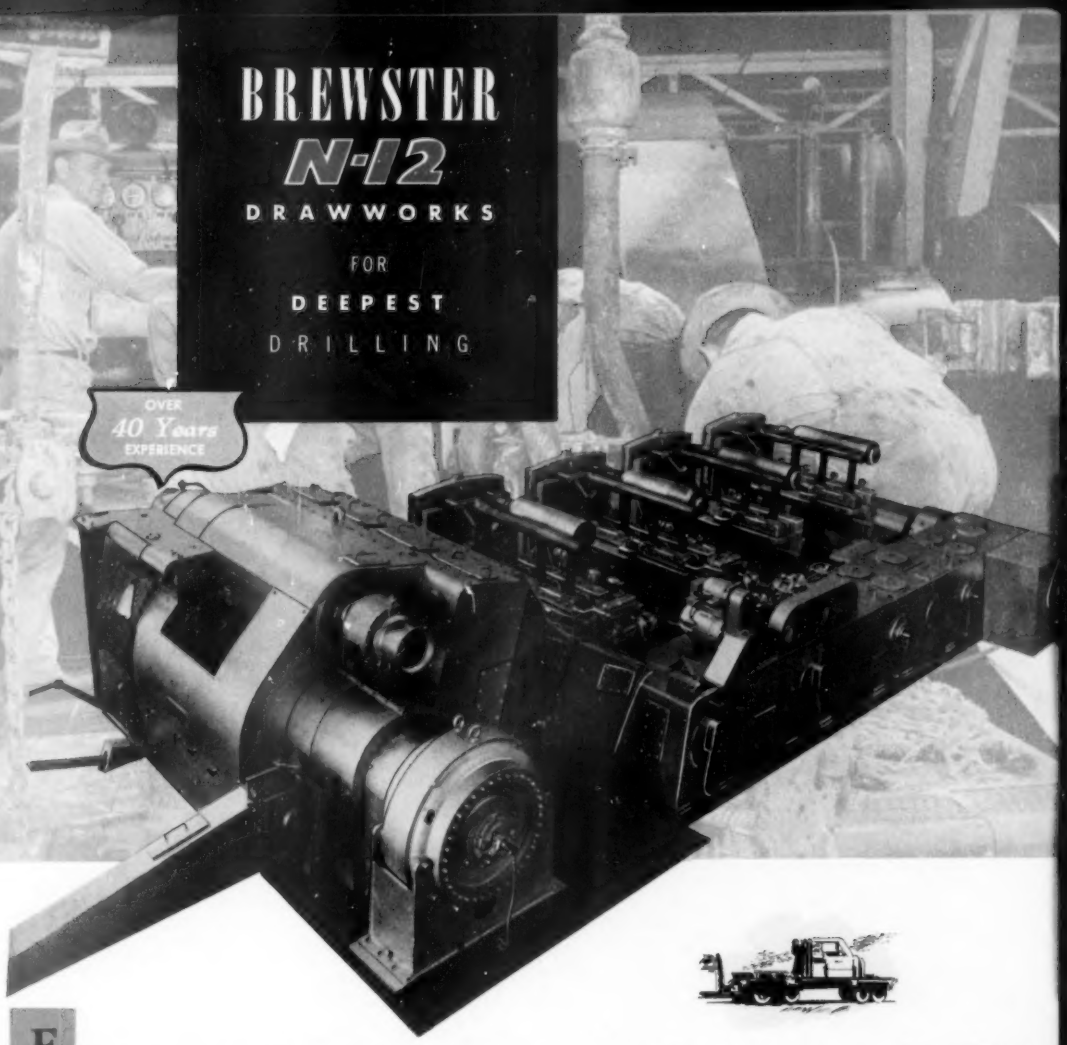
ENGINEERING OFFICES AND JOBBER STOCKS IN ALL INDUSTRIAL CENTERS

THE GATES RUBBER COMPANY • DENVER • U•S•A

World's Largest Maker of V-Belts

BREWSTER N-12 DRAWWORKS FOR DEEPEST DRILLING

OVER *40 Years* EXPERIENCE



Fast at running a heavy string of pipe . . . powerful at the pump drives . . . responsive to the demands of bit and rotary . . . The Brewster N-12 drawworks can concentrate the full might of its *four 400 horsepower engines* on any one drilling operation . . . or it can deliver to any group of operations the required amount of power. A range of *eight speeds forward on drum and rotary*, a variety of compounding combinations, all controlled by air from the driller's position, put the flexible power of the N-12 at the instant command of the driller.

The advanced engineering which went into the design of the N-12, based on Brewster's long experience, has been proven by *two years continuous use in the field.*

DESIGNED FOR EASY HANDLING

The principal components of the rig . . . drawworks, compound and engines . . . mounted on separate skids, make convenient size loads, are easily set up and torn down, with minimum number of connections.

THE BREWSTER COMPANY, INC. SHREVEPORT, LOUISIANA

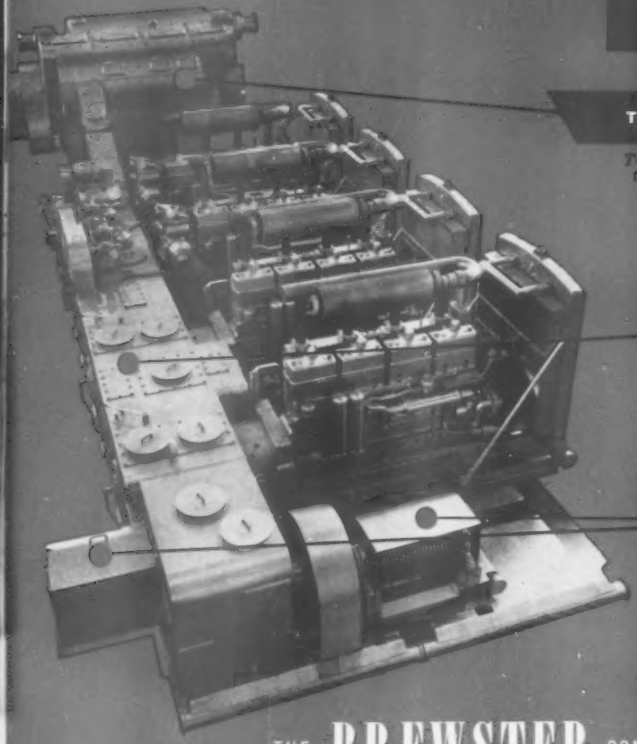
BREWSTER DRILLING EQUIPMENT

ASK YOUR NEAREST SUPPLY HOUSE TO TELL YOU ABOUT THE N-12 DRAWWORKS

Apex Equipment Company • Murray Brooks, Inc. • Reams Supply Company
Bovaird Supply Company • Industrial Supply Company • In Canada:
Rocky Mountain Supply Company—Direct and through recognized export dealers.

SIMPLE, POSITIVE CONTROLS

All controls for the drawworks and engines are air-actuated with control valves mounted on a single convenient control panel. No rigid or universal-jointed connections are required between control panel and power units.



TRANSMISSION

Transmission is compact chain-type, delivering four speeds forward and one speed in reverse. Block clutches are mounted inside the transmission housing; friction clutches are mounted outside housing for accessibility.

COMPOUND

Flexible compounding offers a variety of power combinations. The same sound engineering principles which have been proven by years of service in other Brewster drawworks, have gone into the design of the N-12 compound.

PUMP DRIVES

The two V-belt pump drives, each rated at 850 horsepower, will handle the largest size pumps in use. Auxiliary safety control valves are mounted at pump drive sheaves.

THE **BREWSTER** COMPANY, INC. · SHREVEPORT, LOUISIANA

SPECIFICATIONS

DRUM SPEED	LINE SPEED	LINE PULL	ROTARY SPEED
34.4 RPM	285'/min.	126,000#	56.2
50.1	416	89,000#	83.5
72.6	603	59,000#	122.0
105.9	880	42,000#	177.0
135.5	1,126	31,000#	162.0
197.8	1,644	22,700#	236.0
286.5	2,381	15,300#	341.0
418.2	3,476	10,700#	500.0

AUXILIARY EQUIPMENT *RSH-22 OILBATH ROTARY • MODEL 300 TRAVELING BLOCK • 8-S OILBATH SWIVEL*

PEPS UP PAY ZONES

MORFLO

OTHER HALLIBURTON FIRST!

BREAKS DOWN WATER AND EMULSION BLOCKS

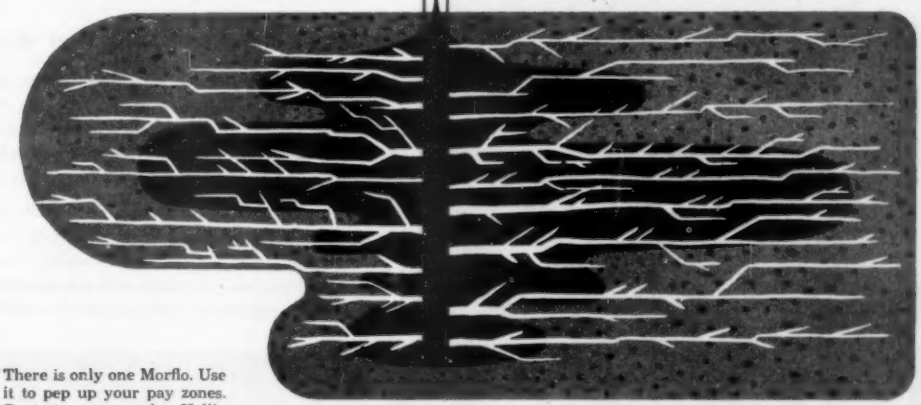
Water *in any form* can block production – connate, or water present in emulsions, or water lost from drilling muds. To remove water from plugged formations, Halliburton originated Morflo, an aromatic sulfonic acid compounded exclusively by Halliburton. Morflo is carried to the plugged zones by light crude or diesel fuel and displaced into the formation by pumping. No special equipment is needed.

Since Morflo is insoluble in oil but soluble in water, it accomplishes three vital missions during a single brief shut down treatment. Morflo breaks down any emulsion present, lowers the surface tension of the water treated *and* completely removes the separated water as well as all fresh or salt connate water present – thus restoring the original viscosity and increasing production.

MORFLO ALSO REMOVES DRILLING MUDS!

Unexcelled as a first completion treatment, Morflo removes lost mud from permeable formations and helps open new flow channels as the well is being produced.

Halliburton Morflo is a better means for completing wells . . . a better means for reworking older wells . . . a better way to correct problems occurring in rotary drilling which affect completion potential.



There is only one Morflo. Use it to pep up your pay zones. Contact your nearby Halliburton representative, or write for technical data. Halliburton Oil Well Cementing Company, Duncan, Okla.

HALLIBURTON

YEARS AHEAD IN ACIDIZING!

For Oil Field Speed . . .

get a dozer that *runs* instead of crawls

plus

this oil field versatility

SIDE-BOOM CRANE

Lifts 14 tons up to 12'. . . 5 tons at maximum 12' reach. Finger-tip electric-power-control for both hoisting and lowering.

67,000-LB. WINCH

snakes pipe, drilling equipment, etc. . . . puts both ends of Tournadozer to profitable use.

Wherever time is worth money, rubber-tired Tournadozers are replacing slow-going crawlers. These high-speed units hustle around at 19 m.p.h. forward, 8 m.p.h. in reverse . . . 2 to 3 times faster than crawlers . . . complete assignments hours and even days sooner. Think what this time-saving can mean on *your* operations . . .

Does more jobs per day

To start with, any job is minutes away. Rubber-tired Tournadozer makes *self-powered* moves anywhere . . . travels 19 m.p.h. over concrete, blacktop, gravel or cross-country . . . gets there sooner . . . completes the job faster . . . is on the next job quicker.

Tournadozer can quickly dig or backfill slush pits . . . clear slides . . . fill washouts . . . maintain haul roads . . . level drill sites . . . push load scrapers . . . assist stalled or mired trucks . . . function as a prime mover to skid or haul your equipment and supplies by trailer. It often

ROOT RAKE

. . . to handle your clearing tasks. Rugged teeth on rake stack brush, roots, rocks quickly, easily.

Tournadozer's high-speed, 186 horsepower, and 2½-yd. blade combine to give you extra yardage on every job from digging slush pits to leveling drill sites. With instantaneous shifts you get into higher dozing speeds faster . . . keep load rolling without loss of momentum.

does many of these tasks in a single day because of its high speed and 100% mobility.

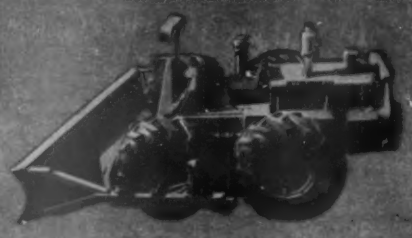
Moves more yds. per hour

Tournadozer not only gets places faster . . . it's also more than twice as fast on dozing jobs as a crawler-dozer. 186 horsepower plus 4-wheel drive on big, low-pressure tires, put plenty of power and traction behind the 2½-yard blade. Tournadozer's constant-mesh transmission gives you instantaneous speed selection, too, without stopping to shift gears. You change speeds simply by flicking a dashboard switch . . . that's all there is to it.

Cuts operating costs

With Tournadozer's rubber-tired traction, you eliminate more than 500 wearing parts of a crawler track assembly . . . save hours of regular maintenance . . . eliminate 500 possible sources of failure and work interruption. Big rubber tires absorb shocks and jolts . . . are easier on both equipment and operator.

It will pay you to have at least one of these high-speed, high-production Tournadozers for all-around utility work in your field. For more information on performance, price and delivery, mail the attached coupon or contact your LeTourneau Distributor and ask for a demonstration.



ANGLEDOZER

. . . for extensive side-hill work. 12' x 4½" blade angles 20° right or left . . . is easily interchangeable with regular dozing blade. Down pressure blade and torque converter are also available.

LETOURNEAU EQUIPMENT

R. G. LeTOURNEAU, INC.

Peoria, Illinois

MAIL TODAY

R. G. LeTOURNEAU, INC., Peoria, Illinois

Please send me additional information on the 186 h.p. C Tournadozer

☐ Specifications ☐ Price ☐ Delivery ☐ Nearest Distributor

NAME_____

TITLE_____

COMPANY_____

TYPE of BUSINESS_____

ADDRESS_____

CITY_____ STATE_____

Tournadozer, Angledozer – Trademark Reg. U.S. Pat. Off. D-149-01

ELLIOTT DIESEL-DRIVEN GENERATORS

are serving all over the map!

Literally thousands of Elliott generators are quietly reeling off the kilowatts, serving in every state of the Union. Types include direct-current, alternating current, horizontal and vertical generators. Elliott "Fabri-Steel" construction used in all present-day Elliott generators, not only provides exceptional rigidity and crack-proof strength, but also facilitates custom-built design to the precise requirements of the individual installation.

Elliott FABRI-STEEL MOTORS AND GENERATORS

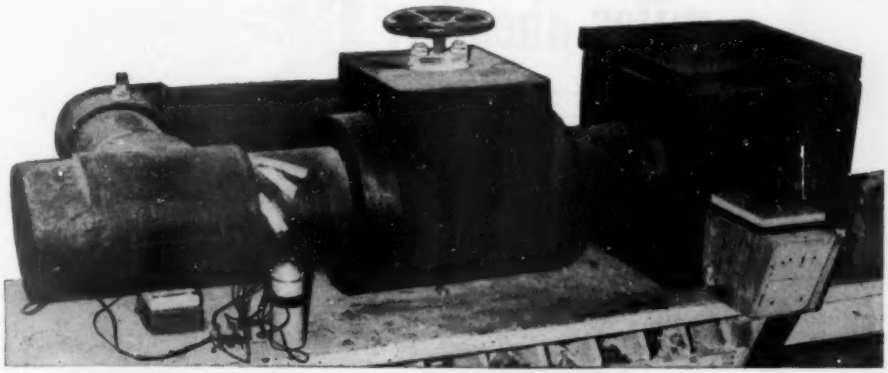
ELLIOTT Company

Ridgway Division
RIDGWAY, PA.

Plants at: JEANNETTE, PA. • RIDGWAY, PA.
AMPERE, N. J. • SPRINGFIELD, O. • NEWARK, N. J.
DISTRICT OFFICES IN PRINCIPAL CITIES

12-5

ON THIS APPARATUS, 3" FOAMGLAS Pipe Covering was tested for a period of one year, cycling between *minus 100° and plus 350° F.* The test was designed to accelerate any deterioration that might occur under actual field conditions. A total of 52 cycles was completed, with no loss of insulating efficiency.



THIS DUAL-TEMPERATURE TEST PROVED

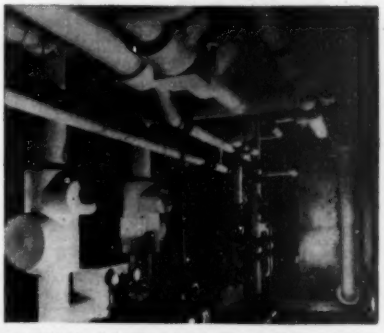
"No loss of insulating efficiency"

● Its ability to withstand *both* extremely low and high temperatures—over long periods of time—has won wide preference for FOAMGLAS among chemical engineers for their low and dual-temperature requirements. It is being used successfully on piping, valves and fittings, heat exchangers, towers, tanks, boilers and other process equipment.

The constant insulating efficiency and durability of FOAMGLAS are due to its cellular glass construction which resists moisture and other harmful elements. FOAMGLAS doesn't get soggy, slip out of place, rot or shrink, as do ordinary materials which constantly need costly maintenance and finally have to be replaced.

Get the latest information on FOAMGLAS whenever you need insulation. Just send the coupon for a sample of the material and a copy of our authoritative booklet.

PITTSBURGH CORNING CORPORATION · PITTSBURGH 22, PA.

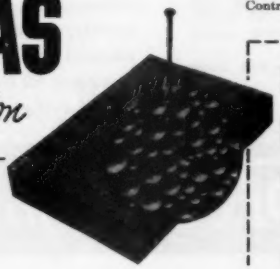


FOAMGLAS insulates these dual-temperature lines. A canvas and paint finish completes the application. General Contractor. Beers Construction Company, Atlanta, Ga. Insulation Contractor: North Brothers, Atlanta, Ga.

PITTSBURGH PC CORNING

FOAMGLAS®

the cellular glass insulation



The *best* glass insulation is cellular glass. The only cellular glass insulation is FOAMGLAS. This unique material is composed of still air, sealed in minute glass cells. It is light weight, incombustible, vermin-proof. It has unusually high resistance to moisture, chemicals and many other elements that cause insulation to deteriorate.

Pittsburgh Corning Corporation
Dept. DD-52, 307 Fourth Avenue, Pittsburgh 22, Pa.

Please send me, without obligation, a sample of FOAMGLAS and your FREE booklet on the use of FOAMGLAS for Piping and Process Equipment.

Name.....

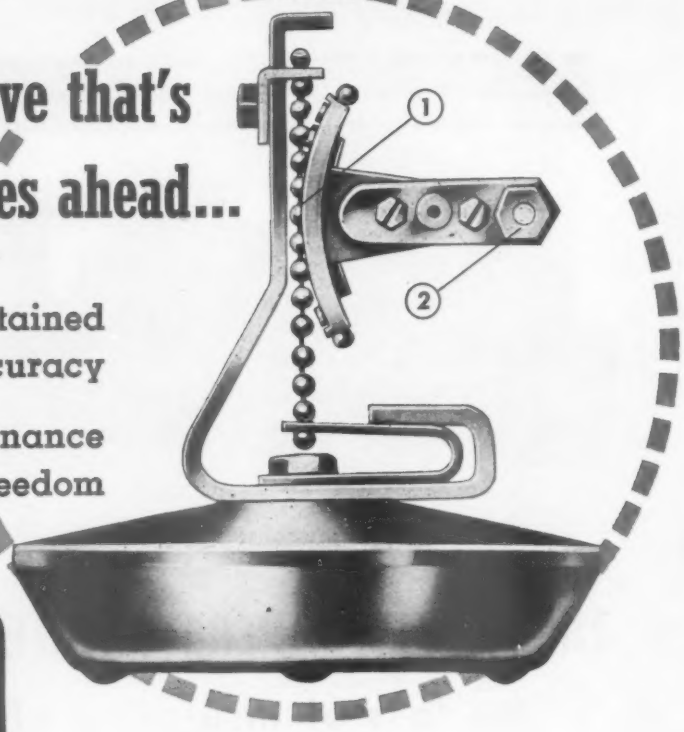
Address.....

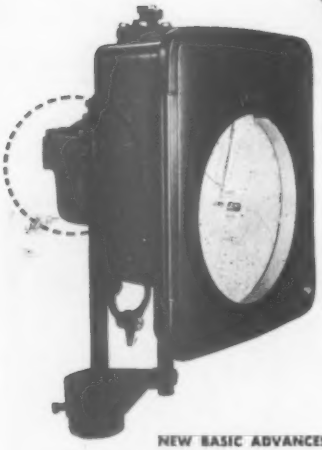
City.....State.....

A meter drive that's miles ahead...

...in sustained accuracy

...in maintenance freedom





NEW BASIC ADVANCES

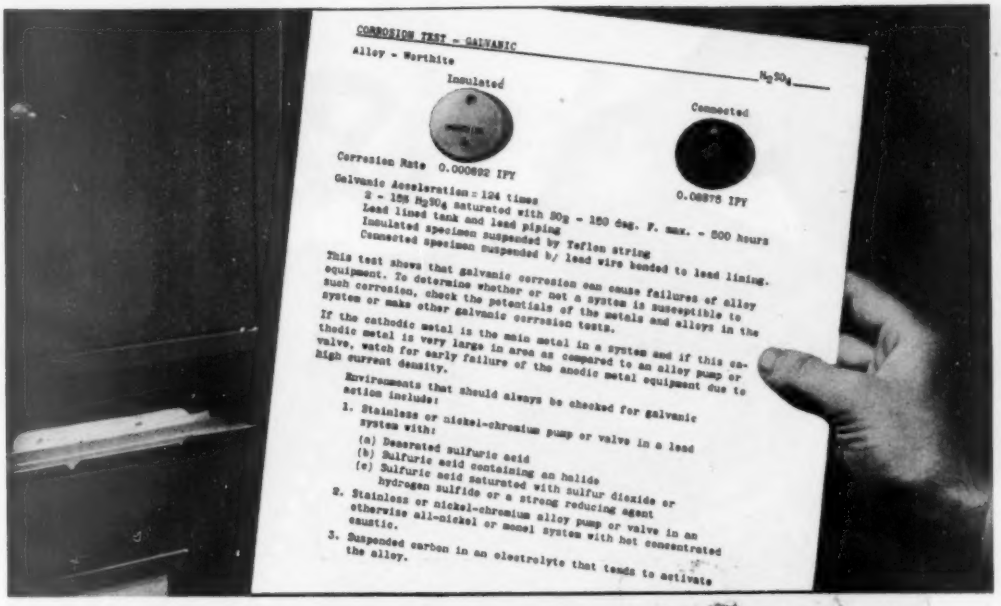
- **Precision float assembly** with stainless steel ball chain and collet-type clamp insures positive, friction-free transmission of float motion through the segmental drive.
- **Pressure-Seal Bearing** is virtually friction-free, completely leak-proof.
- **Sure-Seal Check Floats** insure perfect seating; submerged in mercury to prevent frosting and fouling.
- **Union-coupled U-bend** eliminates gaskets; always lines up.
- **Calibrated Damping Plug** fully adjustable under pressure.

New, outstanding advances in the basic details of Foxboro Flow Meters provide unprecedented standards of dependable accuracy.

For example, Foxboro's exclusive, segmental drive assembly, which eliminates angularity errors altogether, now employs: ❶ stainless steel ball chain that insures perfectly free travel of float . . . ❷ slip-proof collet for positive clamping of segment to the bearing shaft.

Check *all* the advantages of Foxboro Flow Meters, including extra power due to large floats and long travel; float located in high pressure chamber to minimize ambient temperature effects; submerged-in-mercury check floats which prevent mercury losses; unvarying accuracy throughout years of use. Write for Bulletin 460. **The Foxboro Company, 60 Neponset Ave., Foxboro, Mass., U.S.A.**

FOXBORO REG. U. S. PAT. OFF. ... First in FLOW METERS


CORROSION TEST - GALVANIC
Alloy - Worthite
H_2SO_4
Insulated
Connected
Corrosion Rate 0.000692 IPY
0.08878 IPY
Galvanic Acceleration = 124 times
2 - 15% H_2SO_4 saturated with SO_2 - 150 deg. F. max. - 500 hours
Lead lined tank and lead piping
Insulated specimen suspended by Teflon string
Connected specimen suspended by lead wire bonded to lead lining.
This test shows that galvanic corrosion can cause failures of alloy equipment. To determine whether or not a system is susceptible to such corrosion, check the potentials of the metals and alloys in the system or make other galvanic corrosion tests.
If the cathodic metal is the main metal in a system and if this cathodic metal is very large in area as compared to an alloy pump or valve, watch for early failure of the anodic metal equipment due to high current density.
Environments that should always be checked for galvanic action include:
1. Stainless or nickel-chromium pump or valve in a lead system with:
(a) Deaerated sulfuric acid
(b) Sulfuric acid containing an halide
(c) Sulfuric acid saturated with sulfur dioxide or hydrogen sulfide or a strong reducing agent
2. Stainless or nickel-chromium alloy pump or valve in an otherwise all-nickel or monel system with hot concentrated caustic.
3. Suspended carbon in an electrolyte that tends to activate the alloy.

A CASE STUDY FROM THE WORTHINGTON FILES. This Worthington test sheet indicates that the galvanic action could be virtually eliminated in this manufacturer's system by *insulation*—that is, a complete separation of the alloy pump from metallic contact with lead surfaces. The recommendation was made to him as a result of a Worthington test made on the solutions his system was pumping.

It Takes More Than A Pump To Solve A Pumping Problem!

Worthington's files are packed with many stories like this one. Each is proof positive that you get a lot more than a Worthite* pump when you buy from Worthington.

It was the age-old problem of chemical pumping, corrosion. But this customer found a way out—a *practical solution* that saved him plenty of expense in extra maintenance and lost production time.

He wrote a letter to Worthington. Could we tell him whether there was anything he could do to slow down or stop this corrosion? He was pumping a 15% solution of sulfuric acid saturated with sulfur dioxide. Maximum temperature of solution was 150° F.

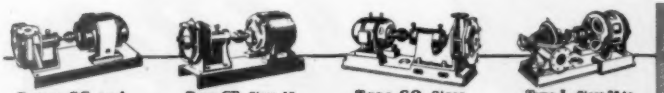
This wasn't a new problem for Worthington corrosion specialists. Experience had shown them that under these conditions galvanic action could be his trouble. They ran the test illustrated above which conclusively proved these assumptions correct.

Result? The customer insulated the system and his troublesome corrosion problem was brought under control.

At Worthington, we welcome the chance to hear about *your* pumping problems—either on a present installation or in the design of a new system. For it is only through such close contact with the industry that we can continue to build the kind of pumps and offer the kind of services that have led pump users the world over to the conclusion that *there's more worth in Worthington.*

Worthington Pump and Machinery Corporation, Centrifugal Pump Division, Harrison, New Jersey.

*Reg. U. S. Pat. Off. C1.6



Types CG and CGL. Sizes ¾" to 10". Capacities to 6000 GPM; heads to 200 ft. Liquid ends of WORTHITE.

Type CF. Sizes 1" to 4". Capacities to 1000 GPM; heads to 130 ft. Standard, all iron and all bronze.

Type CQ. Sizes 1½" to 3". Capacities to 600 GPM; heads to 130 ft. at 1750 RPM. Closed impeller.

Type L. Sizes 3" to 8". Capacities to 2250 GPM; heads to 300 ft. Single stage volute. For general service.

The World's Broadest Line Assures You the Right Pump for Every Job

WORTHINGTON

Centrifugal Pumps

Smart

Dependable Dayton Drives

Convenient Warehouse Stocks

Field Engineering Service

V-Belts

©D. R. 1954

Move in the OIL FIELD!

There's no doubt about it — one of the wisest moves a drilling superintendent can make is to put Dayton Thorobred V-Belts on his rig. For wherever oil wells are drilled, cost-conscious operators have found that husky Thorobreds are the trouble-free drives for mud pumps . . . rotary . . . every power transmission job.

Why do Dayton Thorobreds give such reliable service in tough applications? Well, a look at the cross section of a Thorobred shows why. See those sturdy cords? They're continuous filament, high tenacity rayon — electronically processed on Dayton's exclusive electronic train. And that rugged cover is made of rubber filled all-weather "Hi-Twist" fabric. No wonder these belts have such a reputation for long life!

Dayton Warehouses provide convenient stocks in all American oil producing centers — and Dayton Oil Field Engineers offer on-the-spot help in clearing up any drilling or pumping drive problem.

Get in touch with the Dayton Distributor or Warehouse in your area. You'll agree it's one of the wisest moves you could make!

DAYTON RUBBER COMPANY, DAYTON 1, OHIO

by Dayton Rubber

Since 1905

WORLD'S LARGEST MANUFACTURER OF V-BELTS

How earnings work to produce more oil

IMPORTANT FACTS FROM THE 1951 ANNUAL REPORT OF STANDARD OIL COMPANY (NEW JERSEY)

IN THE FREE WORLD, people use tremendous amounts of oil. Meeting their needs, rising year after year, has been one of the notable industrial accomplishments of our time.

For example, the peak war effort in 1945 pushed use of oil 23% higher than in 1940. This looked like a mark that would not be topped for years.

But vigorous post-war reconstruction, and expansion of industry, transportation and agriculture, made oil use in 1946 greater even than in 1945. And in 1951 it was 58% higher than in 1946.

To supply this oil has called for great expansion by the petroleum industry. It has meant new wells, pipe lines, storage tanks, refineries, tankships . . . in times of high costs.

The job has required a vast outlay of money, *which has been provided largely by the industry's own earnings.*

How this works out is shown in the case of Standard Oil Company (New Jersey), an American corporation having investments in companies carrying on the varied functions of the oil business in the United States and abroad.

Consolidated net income of Jersey and affiliates for 1951 was $528,461,000. Of this, $278,862,000, or 53%, was used to help provide new equipment.

In the six years since 1945, Jersey and affiliates have spent $2,350,000,000 for replacement and expansion of facilities. Depreciation and depletion reserves provided only 44% of that amount. The largest share of the expenditure was met by the reinvestment of earnings.

During 1951 alone, to do their part in supplying more oil for the free world, companies in which Standard Oil Company (New Jersey) has investments:

Discovered Oil

In the United States, made new oil discoveries in the Williston basin, the Uinta basin, and Texas . . . In Latin America, extended known fields in Venezuela, and opened up a new area in Colombia . . . In the Middle East, Arabian American Oil Company made two important discoveries, one in the offshore waters of the Persian Gulf . . .

Developed Production

In the United States, drilled more wells than in any year since 1937, and greatly expanded secondary recovery operations to get more oil from existing fields . . . In Venezuela, completed 190 producing wells . . . In Canada, increased total producing wells from 844 to 1,140 . . . In the Middle East, Arabian American Oil Company and Iraq Petroleum Company increased production 57% . . .

Expanded Refining Capacity

At Baton Rouge, La., and Everett, Mass., enlarged refineries . . . At Winnipeg, in Canada, opened a new refinery and, at Edmonton, Sarnia, and Vancouver added facilities . . . At Fawley, England, put the largest refinery in the United Kingdom on stream . . . At Antwerp, Belgium, proceeded with field work on a large refinery . . . at Durban, South Africa, started work on a refinery, and at Bombay, India, completed arrangements to build a new one . . .

Expanded Transportation

In the United States, boosted pipe line capacity substantially, particularly in the South . . . Ordered twelve new ocean-going tankships, bringing the post-war total of those purchased or contracted for to 72 . . . Began to bring Western Canadian oil to consumers in the Eastern provinces by means of two large, new Great Lakes tankers, with a third going in service this spring . . . In Iraq, Iraq Petroleum Company brought near completion a new 556-mile pipe line from the oil fields to the Mediterranean. It will permit oil production in Iraq to be more than doubled in 1952 . . .

Advanced Research

Put into the search for new and improved processes and products a total of $23,100,000, one of the largest expenditures for such a purpose by any company . . .

Continued Good Employee Relations

The interest of the company and its employees in maintaining good mutual relationships resulted in another year without strikes or work stoppages in the domestic affiliates. This was an important factor in meeting the increased demand for oil . . .

AS THE FREE WORLD GROWS IN STRENGTH, it calls for more and more oil. So, not just to the 254,000 shareholders who own Jersey, but to people on freedom's side all through the world, the two outstanding facts about our Annual Report for 1951 are: (1) Jersey affiliates again did their part in meeting the growing needs for oil; and (2) the competitive business system that did this job produced the earnings to help meet even greater needs in the future.

FINANCIAL SUMMARY

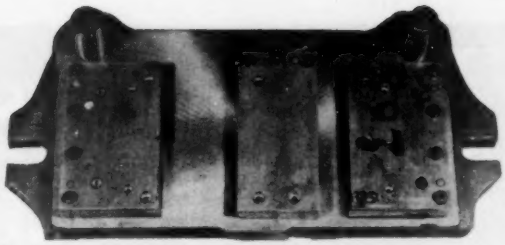
Standard Oil Company (New Jersey) and Consolidated Affiliates

Total income from sales, services, dividends and interest	$3,863,317,000
Net income	$528,461,000
	or $8.72 per share
Dividends	$249,599,000
	or $4.12½ per share
Wages and other employment costs	$600,500,000
Taxes charged to income	$400,700,000
Other taxes, collected for governments	$329,900,000
Spent for new plants and facilities	$381,824,000
Number of shareholder-owners	254,000
Number of employees	120,000

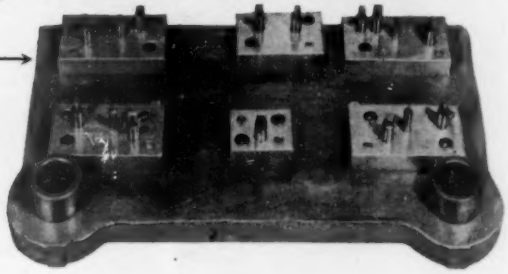
We'll gladly send a copy of the full report if you wish one. Write Room 1626, 30 Rockefeller Plaza, New York 20, N.Y.

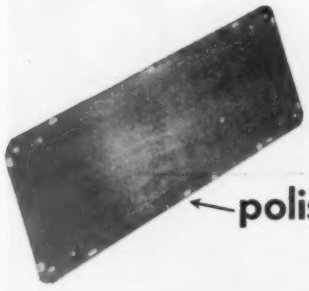
STANDARD OIL COMPANY (NEW JERSEY)
AND AFFILIATED COMPANIES

Die repairs eliminated →



punch life increased →





← polishing of stampings no longer needed

. . . with dies made of Graph-Mo steel

STAMPING out stainless steel parts for medical sterilizers was causing trouble for the Pelton & Crane Company, Detroit. The dies they were using—made of an ordinary tool steel—became worn after only a few hundred stampings. Holes in the parts were ragged, requiring polishing. The punches were continually chipping and cracking.

They then tried dies made of Graph-Mo—one of four Timken® graphitic tool steels. After 12,000 stampings, the Graph-Mo dies still showed no signs of wear. Stampings were clean and smooth. No polishing was needed. Pelton & Crane reports: "The fact that Graph-Mo stands up on stainless steel, where other types we used continually broke down, leads us to believe there is no finer tool steel on the market today than Graph-Mo."

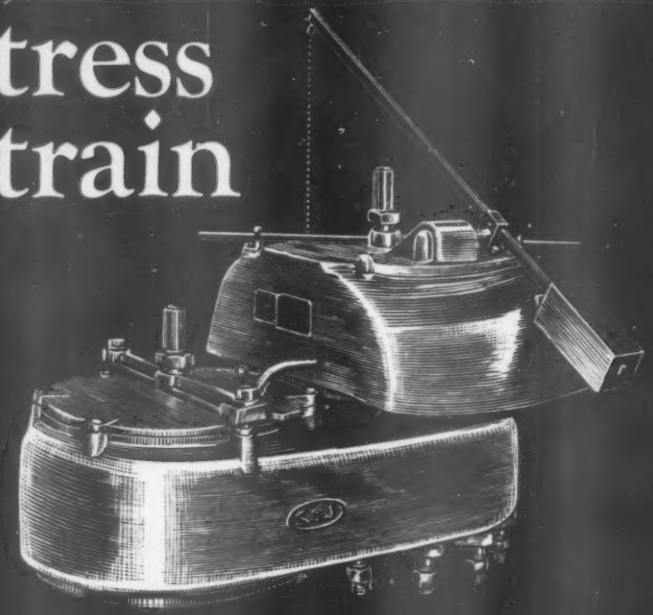
Graph-Mo offers many advantages in dies and punches. Because of free graphite in its structure, Graph-Mo has minimum tendency to scuff or gall. Because it contains diamond-hard carbides, it offers unusual resistance to wear. Graph-Mo has excellent stability. Surfaces may be finished to precision tolerances. Machining is far easier than with ordinary tool steels. And Graph-Mo's uniform response to heat treatment prevents distortion in hardening.

For further information, write on your company letterhead for new, 10th edition of Timken Graphitic Steel Data Book. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.

NO stress
NO strain



ABOVE GROUND petroleum storage and transfer tanks never suffer from stresses, aches or strains when equipped with the new Shand & Jurs poppet type breather valve. It provides tremendously increased flow capacities within the range of normal pressure settings and overpressure allowances, and this S&J poppet type breather valve will deliver the acme of performance under all weather and operating conditions.

Check these quality features that make the S&J poppet type breather valve, Fig. ST-6949, the prescription for storage and transfer tank health: valve pallets automatically drain all condensation away from their seats; molded thermosetting phenolic pallets and stainless steel pallet guides offer maximum resistance to corrosion; completely screened valve openings keep windblown particles, insects, rain, sleet and snow from hindering operation; quick removable pressure and vacuum hoods for easy inspection or what little maintenance is necessary.

S&J

Shand and Jurs Co. 8TH AND CARLTON STREETS · BERKELEY · CALIFORNIA

NEW YORK 295 Madison Ave. · CHICAGO 10409 S. Western Ave. · HOUSTON 827 M. & M. Bldg. · TULSA 310 Thompson Bldg. · LOS ANGELES 714 W. Olympic Blvd. · SEATTLE 3000 Western Ave.

MONTREAL, QUE. 360 Notre Dame St. West · VANCOUVER, B. C. 3277 Main St. · FORT ERIE, ONT. · DARLINGTON, ENG. · CARACAS, VEN.

BJ engineering puts power to work for you...

TYPE B POWER SLIPS smooth pipe handling on round trips

BJ TYPE B POWER SLIPS are another important BJ power development made to cut your drilling costs. Here's why —

FAST! Slips are pressure raised *and pressure set* at the touch of a foot pedal...pipe is pressure centered...slip ring floats free when making up or breaking out with the table...BJ Power Slips swing in or out of operating position in a matter of seconds.

COMPACT! A single husky pressure cylinder raises and lowers slips instantly . . . offset arm construction increases work room . . . unitized slips are quickly changed for different drill pipe and casing sizes.

SAFE! When BJ slips are set, arm ring clears top of rotary table by several inches — an important safety point. Rugged BJ construction insures ample strength for the heaviest pipe strings.

VERSATILE! The Type B handles 2⅜" to 7" drill pipe or casing by simply changing slips. *It can be unitized with any rotary . . . is installed without substructure changes.*

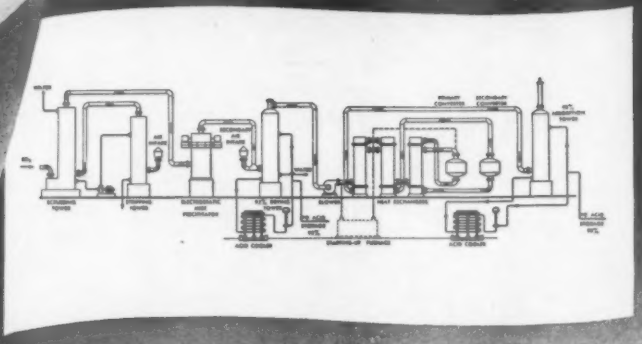
See your nearby BJ Representative who has all the facts on Type B Power Slips. Write for Bulletin 450 describing Type B Slips in full detail.

BJ MEANS ENGINEERED OIL TOOLS

Byron Jackson Co.

SO_2 up the stack....

...wastes a valuable source of H_2SO_4



You can produce much-needed sulfuric acid at a profit, if you have by-product sulfur dioxide in suitable quantity and strength from your chemical or smelting operations. The Chemico process, diagrammed above, or modified to suit specific conditions, provides a practical, efficient method for converting SO_2 into clean sulfuric acid. Chemico will design and construct the complete plant . . . deliver it in smooth-running operation on a performance-guaranteed basis. For specific recommendations, write us describing your problem fully.

This diagram shows how SO_2 gas is purified, dried, reheated and converted into H_2SO_4 of any desired strength.

CHEMICAL CONSTRUCTION CORPORATION

A UNIT OF AMERICAN CYANAMID COMPANY

488 MADISON AVENUE, NEW YORK 22, N. Y.

CABLES: CHEMICONST, NEW YORK

TECHNICAL REPRESENTATIVE IN EUROPE—CYANAMID PRODUCTS LTD., LONDON

TECHNICAL REPRESENTATIVE IN SOUTHERN AFRICA—SOUTH AFRICA CYANAMID (PTY) LTD., JOHANNESBURG

Chemico plants are profitable investments

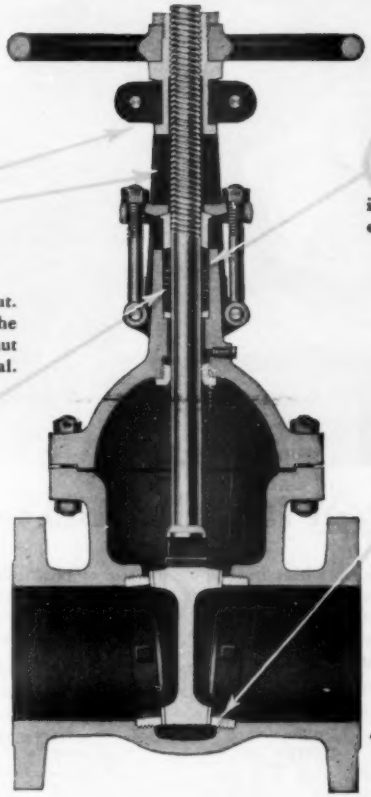
"BUILT TO THE SAME SPECIFICATION STANDARDS – I THOUGHT ALL STEEL VALVES WERE ALIKE AS TWO PEAS"

OIC BUILDS FROM THAT POINT UP

LOOK AT THESE FOUR FEATURES:

1 2–PIECE YOLK DESIGN
simplifies replacement of yoke nut. Pressure can be maintained while the OIC Valve is being repacked. Yoke nut is OIC Alloy 40; non-galling material.

2 STUFFING BOXES
have greater depth than is specified, permitting the use of 7 to 9 rings of packing, with wiper rings below.



3 OIC'S SEAL–EVER PACKING
(exclusive with OIC) lasts 10 to 15 times longer than ordinary packing. It stops pitting and corrosion of stems.

4 SEAT RINGS
are end-seated and are subjected only to compression forces when valve is closed; no loosening of seat rings with repeated opening and closing of the valve. No open spaces to cause turbulence, accumulate dirt and hasten corrosion.

THE BEST STEEL VALVE YOU CAN BUY

This combination involving yoke design, stuffing boxes, packing and seat rings is evidence of OIC's desire to build *beyond* minimum specifications.

THE OHIO INJECTOR COMPANY, WADSWORTH, OHIO

OIC
FOUNDED 1883

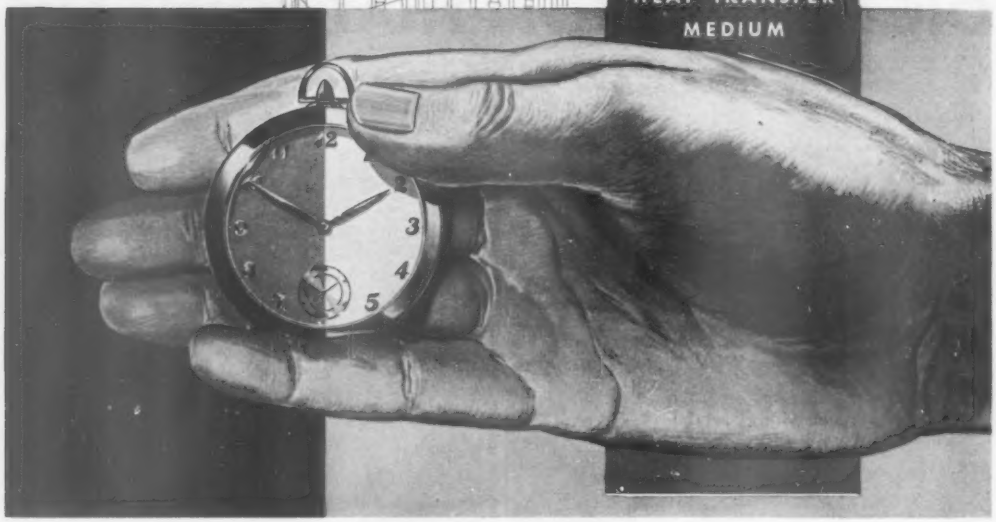
VALVES

FORGED AND CAST STEEL · IRON · BRONZE

on the job 24 hours a day

DOWTHERM

the
MODERN
HEAT TRANSFER
MEDIUM



FOR DEPENDABLE HEAT IN PROCESSING OPERATIONS

DOWTHERM® is your most dependable heat transfer medium! DOWTHERM permits you to have accurate, high temperatures for the complete recovery of many petroleum fractions. At temperatures ranging from 300°F. to 750°F., a DOWTHERM system can be operated at *exceedingly low pressures*. Less equipment is required because of the higher heat transfer coefficient of DOWTHERM.

Important, too, a system using DOWTHERM can be operated with a minimum of maintenance. With non-fouling properties, DOWTHERM eliminates forced shut-downs of your heat processing equipment. Also, coking of the heated stream may be minimized with the use of DOWTHERM. And, when alternate heating and cooling are required, DOWTHERM can be used in the same equipment. For complete dependability in your heat process equipment . . . investigate DOWTHERM. Write Dow today for complete information.

Attention Process Men . . . Use DOWTHERM

. . . for concentrating sulfuric acid.

. . . for selective catalytic polymerization in the production of iso-octane.

. . . For all processes requiring heat at 300°F. to 750°F.

THE DOW CHEMICAL COMPANY
Midland, Michigan

The Dow Chemical Company, Dept. DO-27
Midland, Michigan

"Tell Me More About DOWTHERM"

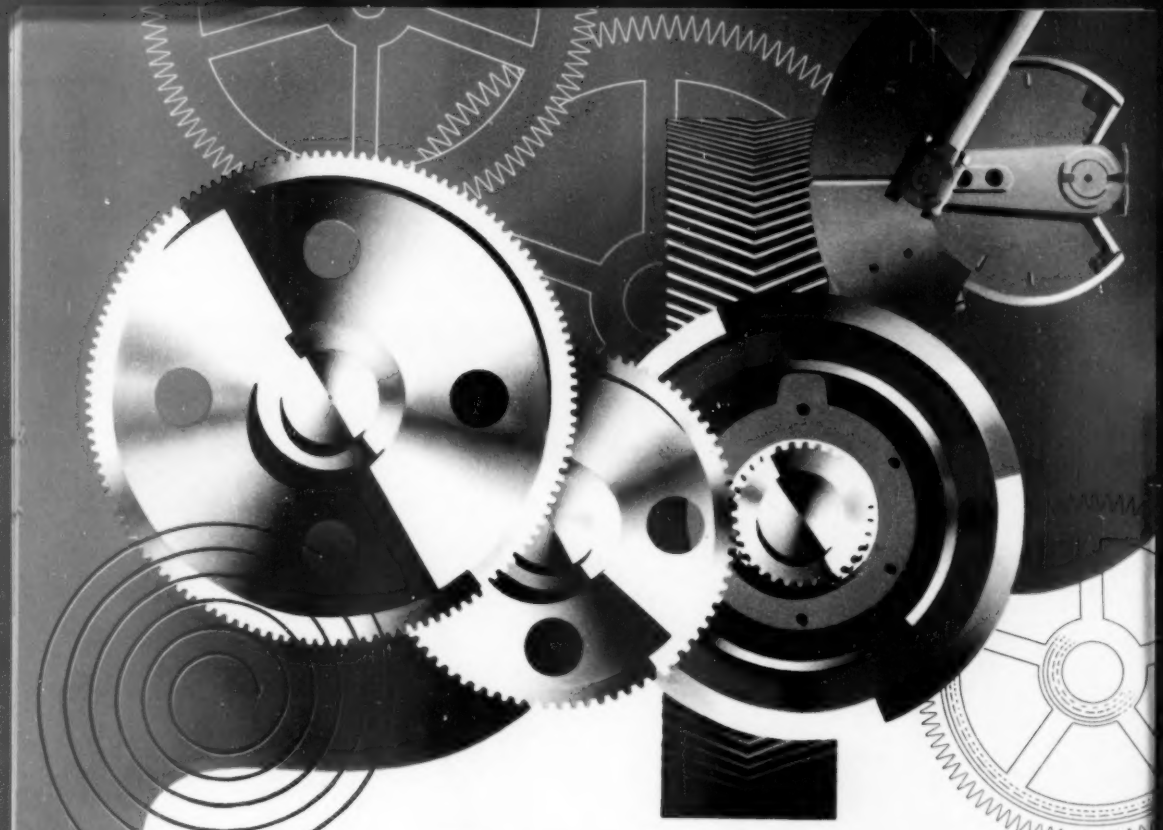
Name _____ Title _____

Company _____

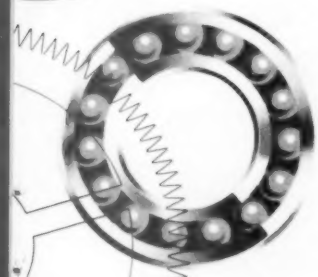
Address _____

City _____ State _____

DOW
CHEMICALS



Built like a Watch for Duty as a Workhorse



National Pumping Units are such common sights on the horizon, they're used so extensively in the oil fields, that even the men who buy them or service them may forget how precisely they are built. The standards of workmanship in the gearboxes, the unique alignment compensation in the beam hanger, the needle-bearing suspension of the walking beam—these are just a few of the refinements of the type to be found in every unit of National drilling or production equipment.

But these refinements are not limited to National Pumping Units. Every piece of oil drilling or production equipment built by National Supply, every length of oil country tubular goods bearing the Spang name, every Superior drilling engine, is produced under quality control standards similar to those used in watchmaking.

Nor is this precision manufacturing a matter of chance. During more than a half century of service to the petroleum industry the research, development, and technological programs at National Supply have been directed toward the continuous improvement of drilling and production equipment, and tubular goods, to meet the industry's expanding needs.

As a result there's extra service life built into National Supply equipment and that's quite evident wherever you go in the oil fields.

NATIONAL BLUE PRODUCTS

THE NATIONAL SUPPLY COMPANY

General Sales Offices: Toledo, Ohio

Division Offices: Casper · Ft. Worth · Houston · Pittsburgh · Tulsa · Torrance

Canada: The National Supply Company, Limited, 702 Barron Building, 610 Eighth Avenue, West, Calgary, Alberta

Export: 600 Fifth Avenue, New York 20, N. Y., U.S.A.; River Plate House, 12 South Place, London E. C. 2

For
NATIONAL
NATIONAL

every requirement from completion to depletion ——

National Pumping Units...

The familiar walking beam of a "National Blue" pumping unit is, however, only a symbol of the long list of National and Ideal equipment used in petroleum production.

These products were developed to provide an integrated line of equipment for efficient and economical extraction from completion to depletion.

The extent of the National Supply catalog of production equipment is emphasized by the wide range of sizes, 12 in all, of National Pumping Units. With API Walking Beam Ratings from 3,200# to 32,400#, this line of scientifically constructed units includes 79 standard combinations designed to fulfill every possible well requirement.

In the development and expansion of the line of National Pumping Units, the results of the extensive research in sucker rods and rod pumping problems by National Supply's field technicians were available to the engineers engaged with pumping units.

This integration of research and development at National Supply provided the basis for the geometrical increasing series of Peak Torque Ratings of National Pumping Units from 6,000 to 456,000 inch-pounds to conform to actual pump loading conditions.

National Pumping Units, as well as the thousands of other National Supply products for the petroleum industry, are available through the National Supply Stores at every important crossroad in the oil country. Why not drop in?

THE NATIONAL SUPPLY COMPANY

General Sales Offices: Toledo, Ohio

Division Offices: Casper · Ft. Worth · Houston · Pittsburgh · Tulsa · Torrance

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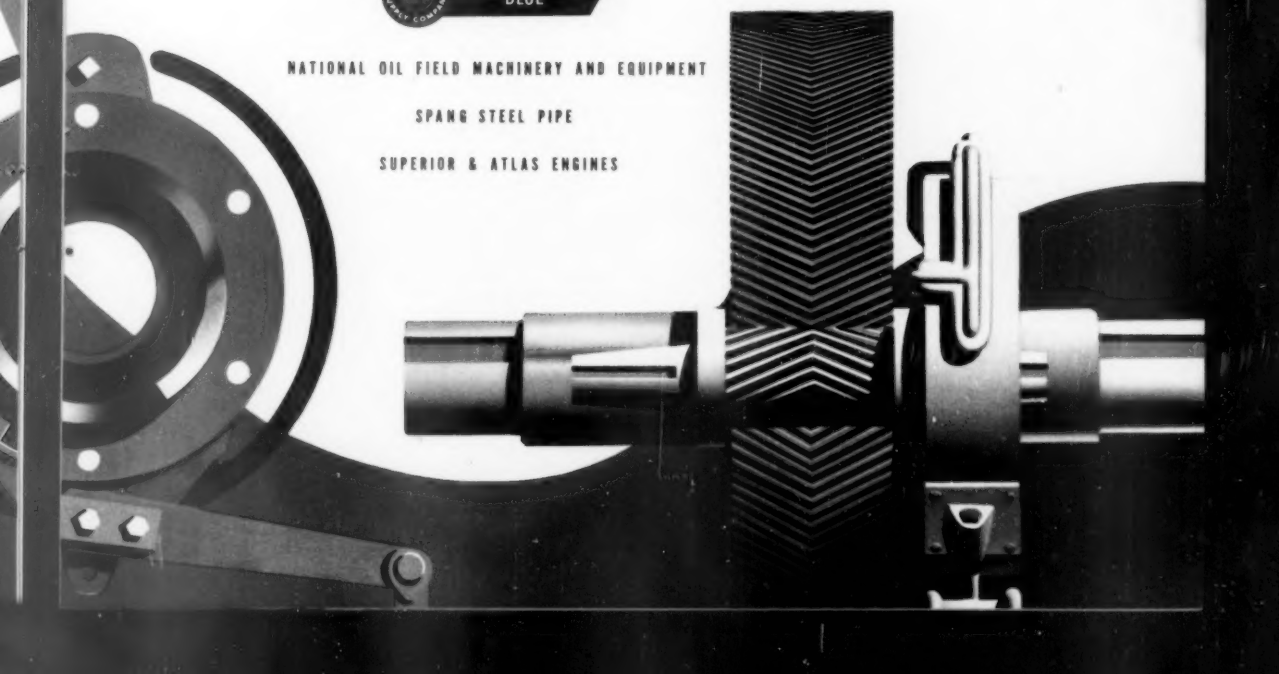
NATIONAL BLUE PRODUCTS

NATIONAL OIL FIELD MACHINERY AND EQUIPMENT

SPANG STEEL PIPE

SUPERIOR & ATLAS ENGINES



National Sucker Rods...

an engineering development and an engineering service

In sucker rods, too, the coordinated program of field and laboratory research at National Supply means progress always in metallurgy and manufacturing.

Because the design of a sucker rod string is an engineering problem, National Supply's oil field equipment specialists made extensive field tests on hundreds of pumping wells to determine the relationship between calculated and actual observed loads. From the correlated data on wells of various depths, under varying speeds and stroke lengths, engineers developed a basic *Impulse Factor* equally useful in the constant improvement of National Sucker Rods and in the proper field application of strings.

This combined knowledge of rod pumping, pumping units, and related problems of producing fields is the basis for the type of supply service available at more than 100 National Supply Stores throughout the oil country. National Sucker Rod Service is available at every one of these supply points.

THE NATIONAL SUPPLY COMPANY

General Sales Offices: Toledo, Ohio

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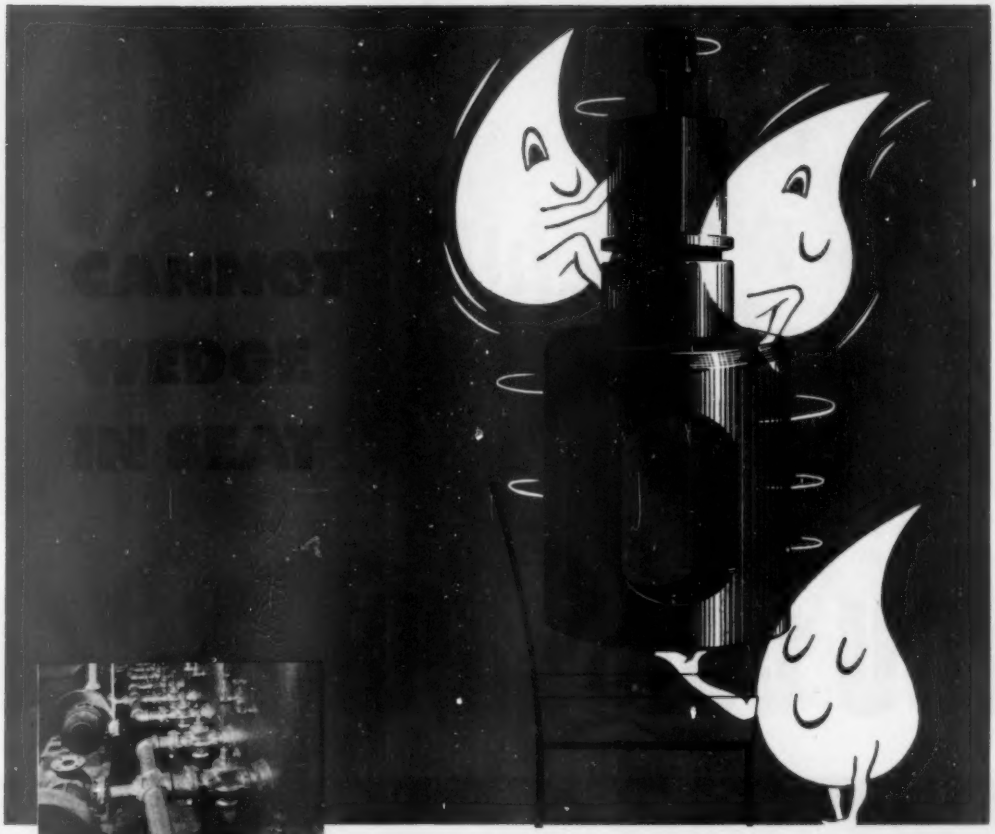
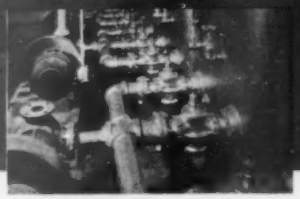
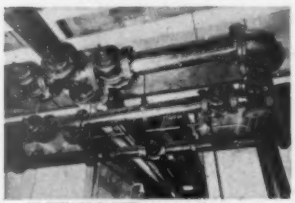




IN CHEMICAL PLANTS A.C.F. "full pipe area" valves offer no obstruction... full flow for abrasives, suspensions.

IN THE PETROLEUM INDUSTRY where seconds count in loading and unloading A.C.F. Valves give fastest possible flow.



IN SEWAGE PLANTS obstructions are sheared by the knife-edge action of the A.C.F. CYLINDRICAL Plug.

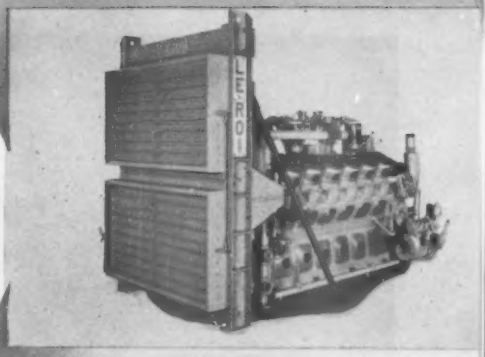
A.C.F. CYLINDRICAL Lubricated Plug Valves have no wedging effect. This plus the quick, quarter-turn shut-off feature gives you safe, sure, split-second control even at capacity flow. Made to last, A.C.F. Valve bearing surfaces are lubricant sealed. Substantial reasons for the absolute leadership of Full Pipe Area A.C.F. Valves.

A.C.F. CYLINDRICAL FULL PIPE AREA PLUG VALVES

Write for Catalogue 4-GG, American Car and Foundry Co., Valve Division, 1501 E. Ferry Ave., Detroit 11, Mich.

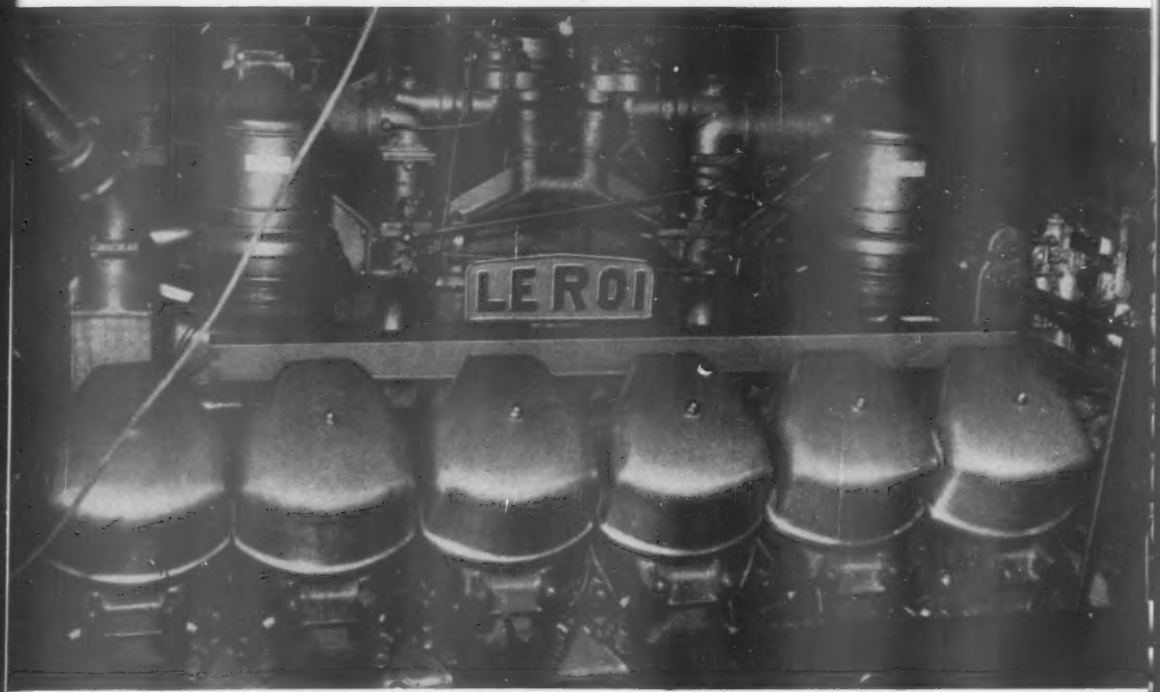
Representatives in 50 Principal Cities

Le Roi 3-way partnership



1 Better Engines. Men from one of the southwest's largest drilling contractors call Le Roi's L3460 "the finest oil-field engine ever made!" 15 of their 19 rigs are powered by Le Roi L3460 or RX Series engines. That's typical of the oil field's endorsement of Le Roi's progressive design policies.

You come out of the



Jack Grace Drilling Co. uses 2 Le Roi L3460's to power their rig. In drilling to 9,100 feet, they use 5" drill pipe which makes hoisting load equivalent of 15,000 feet of 4½" pipe.

2 Better Applications. Exclusive Le Roi distributors and factory men are oil-field power specialists. They know engines. That's why they can select the right power unit for any application. That's why you can bank on Le Roi for dependable, low-cost power.

3 Better Service. Ample factory, branch office, and distributor parts stocks mean minimum downtime for repairs. Skilled service men are ready to go 24 hours a day. Keeping your Le Roi engines running is a recognized responsibility.

hole fast!

two Le Roi L3460's hoist 5" pipe from 8300 ft. on wet trip in just two hours!

This recent experience of Jack Grace Drilling Co., Wichita Falls, Texas, is just one demonstration of what the Le Roi L3460's extra power can do. Reports from all fields show that when you need power — fast! — you can count on your Le Roi L3460's.

They are conservatively rated — have plenty of reserve power to pull you out of the tight spots. And they respond to the throttle lightning-fast for hoisting service.

Here you have oil-field power at its best: A wide speed range from 600 to 1350 rpm. Horsepower from 350 to 600 max. Lugging power at slow speeds. Compactness that helps you keep over-all width and weight limitations. Dependability and economy under continuous loads. Like all Le Roi engines, the L3460 operates on the most economical fuels in the oil fields — natural gas and butane.

Ask your rig manufacturer, supply house, or Le Roi distributor to show you L3460 and other Le Roi engine installations — or write us. See for yourself why you're way ahead of the field, when you let Le Roi's 3-way partnership work for you.

LE ROI

LE ROI COMPANY

MILWAUKEE 14, WISCONSIN

Plants: Milwaukee • Cleveland • Greenwich, Ohio

Oil Field Headquarters: Tulsa, Oklahoma

See these Le Roi Distributors for a Profitable 3-way Partnership

Oklahoma
Le Roi Company Branch — Tulsa
Carson Machine & Supply Co. — Oklahoma City

East & South Texas, Gulf Coast
Southern Engine and Pump Company — Houston, Kilgore, Edinburg, Dallas, San Antonio, Corpus Christi, Texas, and Lafayette, Houma, Louisiana.

North & West Texas, New Mexico
General Machine & Supply Co. — Odessa, Snyder, Texas.
Nortex Engine & Equipment Co. — Wichita Falls, Texas.

Kansas
Carson Machine and Supply Co. — Great Bend

Illinois — Western Kentucky
Western Machinery & Engine Company — Centralia, Illinois and St. Louis, Missouri.

Michigan
Hafer Engine Service — Reed City

Rocky Mountain Area
Gehring Equipment Co. — Casper, Wyoming, Rangeley, Col.

Mississippi, Arkansas and Northern Louisiana
Ingersoll Corporation — Shreveport, Louisiana, Jackson, Mississippi, El Dorado, Arkansas

West Coast
Le Roi-Rix Machinery Co. — Los Angeles, Long Beach and Bakersfield, Calif.

Appalachian Area
P. C. McKenzie Co., Pittsburgh, Bradford.

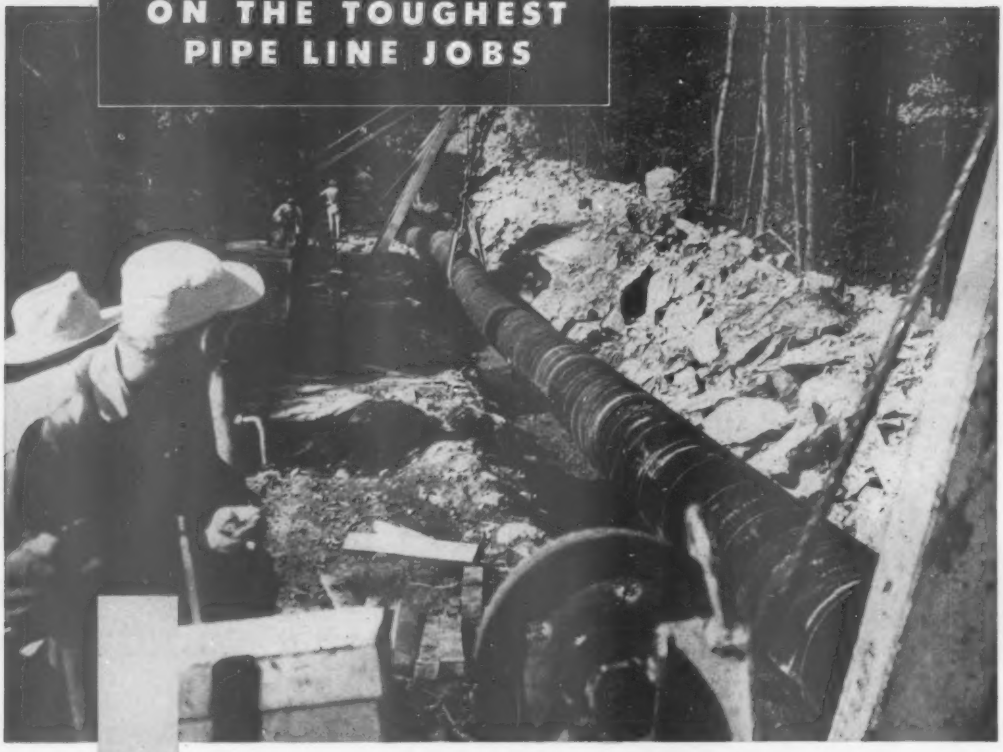
Canada
Lucey Export Ltd. — Calgary, Edmonton, Alberta.

P-114

A Typical Le Roi Service Facility

This service shop, equipped with the finest tools available for engine overhaul, belong to the Gehring Equipment Co., Casper, Wyoming. Gehring provides prompt service to an area stretching from the southern boundary of Colorado to the Canadian border. They maintain the only complete engine parts stock in the Rocky Mountain area. Emergency cases are handled by plane. It is because of service like this that you can always depend on Le Roi.

ON THE TOUGHEST PIPE LINE JOBS



C. F. & I. Welded Steel Pipe Fits Up Faster—Lowers In Easier

C. F. & I. pipe is made from high-tensile steel plates produced entirely in our own plants and quality-controlled through every phase of fabrication starting with the open hearth. Every length is hydraulically expanded for accurate size and perfect roundness... precision bevelled at the ends for time-saving, labor-saving ease of handling in the field. Available in lengths of 40 feet and in overall diameters from 24 inches through 36 inches. For detailed information, write to Claymont Steel Corporation, Claymont, Delaware.

FLANGED AND DISHED HEADS . . . CARBON, ALLOY AND STAINLESS-CLAD STEEL PLATES

C F & I

WELDED STEEL PIPE

PRODUCT OF

CLAYMONT STEEL CORPORATION

SUBSIDIARY OF THE COLORADO FUEL AND IRON CORPORATION

TWO DEPENDABLE, CONSISTENT MATERIALS...

Tops in the field

...for lightening cement slurries

...for restoring lost circulation

with excellent bridging effectiveness...

Strata-Crete* the lightweight, processed perlite aggregate not only permits higher columns at lower pressures... but also bars loss of cement slurry... greatly reduces perforation cracking or shattering.

with excellent bridging qualities...

Strata-Seal* has *proved* its superiorities in well after well... chemically inert, is not affected by mud or heat... permits screening... cuts rig downtime... often saves abandonment.

*Trade Mark GLCC

GREAT LAKES CORPORATION

a subsidiary of

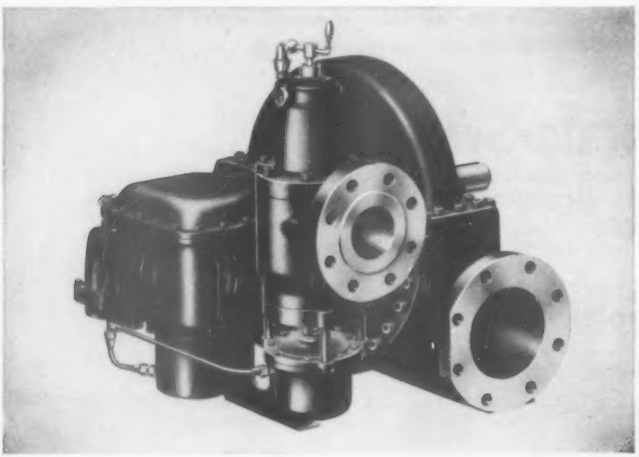
GREAT LAKES CARBON CORPORATION

5845 Atlantic Ave., Long Beach 5, Calif.

Offices in Principal Oil Centers

Packed in 4 cu. ft. bags. Available through Leading Oil Well Cementing Concerns; Leading Mud Service Companies. Write for more data.

Mr. A. Bourgeois, process foreman at Sohio Refinery, adjusts pump valve. Type DP-20, 125 hp turbine increased by 75% the oil thru-put of this pump which supplies crude oil for the distillation unit.



Type DP MECHANICAL-DRIVE TURBINE

This Type DP turbine is one of General Electric's line of mechanical-drive turbines designed for driving pumps, compressors, blowers, etc. Their sturdy construction and many safety features make them ideal for many petroleum industry applications.

At Sohio's Toledo Refinery, this 15 hp, Type DP-16 turbine with non-sparking enclosed overspeed governor, safely pumps propane in an explosive atmosphere.

Mr. Eugene Ten Eyck and Mr. E. J. Bissonnette of Sohio Refinery discuss stocking of interchangeable parts for the Type DP turbines installed at the Refinery.

Sohio Refinery picks G-E turbine drives to increase oil thru-put

Engineers at Sohio's Toledo Refinery installed two G-E mechanical-drive turbines to help eliminate a bottleneck in refinery operations. A General Electric Type DP-20 turbine increased oil thru-put on one pump at Sohio by 75%, when it replaced older drive equipment. Total daily thru-put of the one pump now equals the former capacity of two pumps.

INSTALLED IN HAZARDOUS AREA

Sohio also installed a G-E Type DP-16 turbine in an explosive atmosphere to pump almost pure propane. The enclosed, non-sparking overspeed governor and the positive trip-throttle valve (which shut off all steam flow in case of overspeed) reduce hazards in this area. The turbine, which operates twenty-four hours per day, has required no maintenance during its first year of service.

VIBRATION REDUCED

Replacement of previous drive equipment with a G-E turbine now assures longer life to other machinery in the area. For G-E turbines with their center-line support and rigid assembly of buckets are now contributing to smooth operation at the refinery.

INTERCHANGEABLE PARTS

Use of G-E standard turbines can make stocking of spare parts a simple matter—most replacement parts are interchangeable among various frame sizes of G-E Type DP turbines. Stocking costs are cut, yet parts are available when needed.

This same parts standardization adds to the turbine's flexibility—often the turbine can be adapted to a new plant application with only minor adjustments. Horsepower range can be changed by substituting a different nozzle plate and valve parts.

For more information about the many advantages which these standardized turbines offer the petroleum industry, call in your G-E sales-engineer or write for bulletin GEA-4955A, "A New Standard in Mechanical-drive Turbines." Section 252-56, General Electric Co., Schenectady 5, N. Y.

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"In the field of regulation, there is always the danger of the use of regulation for regulation's sake, interfering with the efficient function of management and forcing the maintenance of unprofitable services or inefficient and outmoded practices. In general I believe that this gratuitous regulation has been avoided, and that industry and the user have markedly benefitted as a result of government action."

Secretary of Commerce Charles Sawyer, addressing the annual meeting of the U. S. Chamber of Commerce, Washington.

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"The continued steady demand for Pennsylvania Grade crude-oil for the past 24 months, coupled with a declining trend of production, clearly presents a situation that can be offset only by a higher market price for crude oil and increase in the rate of drilling and development."

Annual report of South Penn Oil Co.

Question of Survival

"It must be remembered that scarcely a move can be made with respect to production, wages, prices, or sales without official approval from Washington, and when the Government con-

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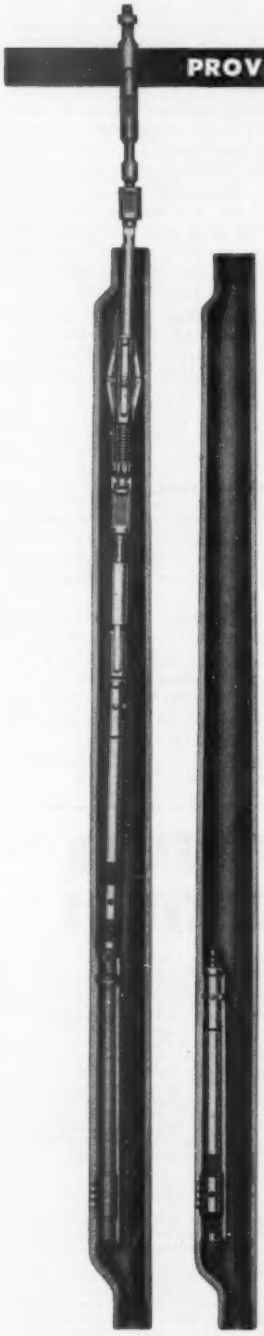

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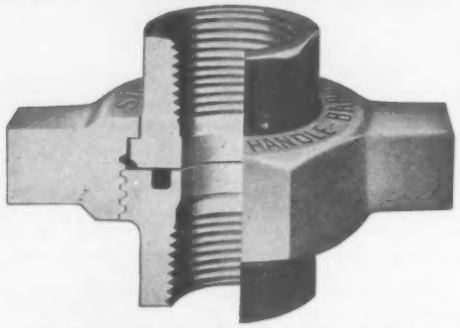

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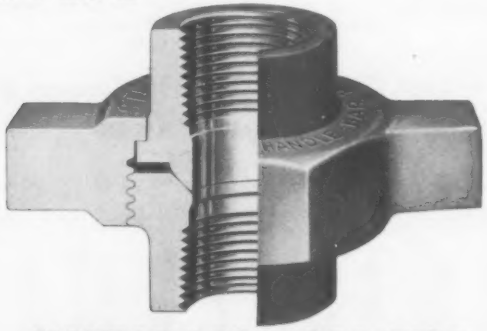

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trols these features of a business it controls not only the capacity of the industry to improve its position to make profits, but its very life as well.

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P. C. Spencer, president, in the annual report of Sinclair Oil Corp.

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United States News advertisement of the Pennsylvania Railroad.

CALENDAR OF EVENTS

MAY

27-28	American Petroleum Institute lubrication committee, Mayo Hotel, Tulsa.
27-29	Southwestern Gas Measurement Short Course, University of Oklahoma, Norman.
28-30	Seventh annual short course in gas technology, sponsored by the Southern Gas Association, Texas College of Arts and Industries, Kingsville, Tex.
29-30	Society of Exploration Geophysicists, Gulf Coast regional meeting, Rice Hotel, Houston.

JUNE

1- 6	Society of Automotive Engineers, summer meeting, Ambassador and Ritz-Carlton hotels, Atlantic City, N. J.
2- 4	Seventh annual short course on process instrumentation, A. & M. College of Texas, College Station.
5- 6	Natural Gas and Petroleum Association of Canada, Niagara Falls, Ontario.
5- 6	Pennsylvania Grade Crude Oil Association, annual meeting, Hotel William Penn, Pittsburgh.

5- 7 National Oil Scouts and Landmen's Association, annual convention, Hilton Hotel, Albuquerque, N. M.

7 California Natural Gasoline Association, annual June Frolic, Rio Hondo Country Club, Downey, Calif.

8-12 Canadian Gas Association, Chateau Frontenac, Quebec.

9-14 American Petroleum Institute, midyear standardization meeting, Brown Palace Hotel, Denver.

12-13 Western Petroleum Refiners Association, regional technical and industrial-relations meeting, Broadview Hotel, Wichita.

13-14 Rocky Mountain Oil and Gas Association, midyear meeting, Rainbow Hotel, Great Falls, Mont.

16-19 American Society of Mechanical Engineers, semiannual meeting, Sheraton - Gibson Hotel, Cincinnati, Ohio.

18-22 International Gas Conference, Brussels, Belgium.

19-20 Kentucky Oil and Gas Association, annual meeting, Hotel Lafayette and Phoenix Hotel, Lexington, Ky.

22-25 Petroleum Equipment Suppliers Association, Mark Hopkins Hotel, San Francisco.

23-24 Michigan Gas Association, annual meeting, Grand Hotel, Mackinac Island, Mich.

23-27 American Society for Testing Materials, annual meeting, Hotel Statler, New York.

23-27 American Institute of Electrical Engineers, summer general meeting, Nicollet Hotel, Minneapolis.

AUG.

1- 3 Wyoming Geological Association, field trip, Big Horn basin.

11-13 Society of Automotive Engineers, national West Coast meeting, Fairmont Hotel, San Francisco.

19-22 American Institute of Electrical Engineers, Pacific general meeting Westward Ho Hotel, Phoenix, Ariz.

25-27 Twelfth Annual Appalachian Gas Measurement Short Course, West Virginia University, Morgantown, W. Va.

SEPT.

3- 5 Pacific Coast Gas Association, Ambassador Hotel, Los Angeles.

8-12 Instrument Society of America, seventh national instrument conference and exhibit, Cleveland.

10-12 National Petroleum Association, fiftieth annual meeting, Hotel Traymore, Atlantic City, N. J.

11-13 American Institute of Chemical Engineers, regional meeting, Palmer House, Chicago.

25-26 Western Petroleum Refiners Association, regional meeting, Hotel Henning, Casper, Wyo.

28-30 American Association of Oilwell Drilling Contractors, annual meeting, Skirvin Hotel, Oklahoma City.

OCT.

1-3 National Association of Corrosion Engineers, South Central Region, technical program and committee meetings, Jung Hotel, New Orleans.

1- 3 American Institute of Mining and Metallurgical Engineers, Mid-Continent fall meeting, petroleum branch, Rich Hotel, Houston.

2- 3 Petroleum Electric Power Association, twenty-third annual meeting, Mayo Hotel, Tulsa.

6 Independent Natural Gas Association of America, annual meeting, Fontenelle Hotel, Omaha, Neb.

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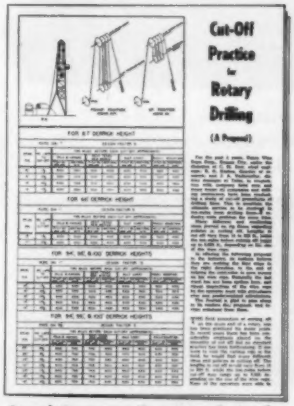

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CP-5

9-10	California Natural Gasoline Association, twenty-seventh annual fall meeting, Ambassador Hotel, Los Angeles.
13-15	Texas Mid-Continent Oil and Gas Association, thirty-third annual meeting, Hotel Texas, Fort Worth.
13-17	American Institute of Electrical Engineers, fall meeting, New Orleans.
16-19	Permian Basin Oil Show, Odessa, Tex.
19	Natural Gasoline Association of America, southern regional meeting, Blackstone Hotel, Tyler, Tex.
20-21	Independent Petroleum Association of America, annual meeting, Mayo Hotel, Tulsa.
23-24	Society of Automotive Engineers, national transportation meeting, Hotel William Penn, Pittsburgh, Pa.
23-24	American Institute of Mining and Metallurgical Engineers, West Coast fall meeting, petroleum branch, Statler Hotel, Los Angeles.
27-31	American Gas Association, annual convention Atlantic City, N. J.
30-Nov. 1	Rocky Mountain Oil and Gas Association, annual meeting, Cosmopolitan Hotel, Denver.

NOV.

3- 4	Society of Automotive Engineers, national diesel engine meeting, Chase Hotel, (tentative), St. Louis, Mo.
6- 7	Society of Automotive Engineers, national fuels and lubricants meeting, Mayo Hotel, Tulsa.
6- 8	Gulf Coast Association of Geological Societies, annual fall meeting, Hotel Driscoll, Corpus Christi, Texas.
8-13	Oil Industry Information Committee, Conrad Hilton Hotel, Chicago.
10-13	American Petroleum Institute, thirty-second annual meeting, Conrad Hilton Hotel and Palmer House, Chicago.
13-14	Society of Exploration Geophysicists, midwestern meeting, Texas Hotel, Fort Worth.
20-22	Instrument Maintenance Short Course, jointly sponsored by Southern California Meter Association and Los Angeles Harbor Junior College.
30-Dec. 5	American Society of Mechanical Engineers, Statler Hotel, New York City.

DEC.

7	Natural Gasoline Association of America, Panhandle-Plains regional meeting, Herring Hotel, Amarillo, Tex.
7-10	American Institute of Chemical Engineers, annual meeting, Hotel Cleveland (Hqs.) and Carter Hotel, Cleveland.

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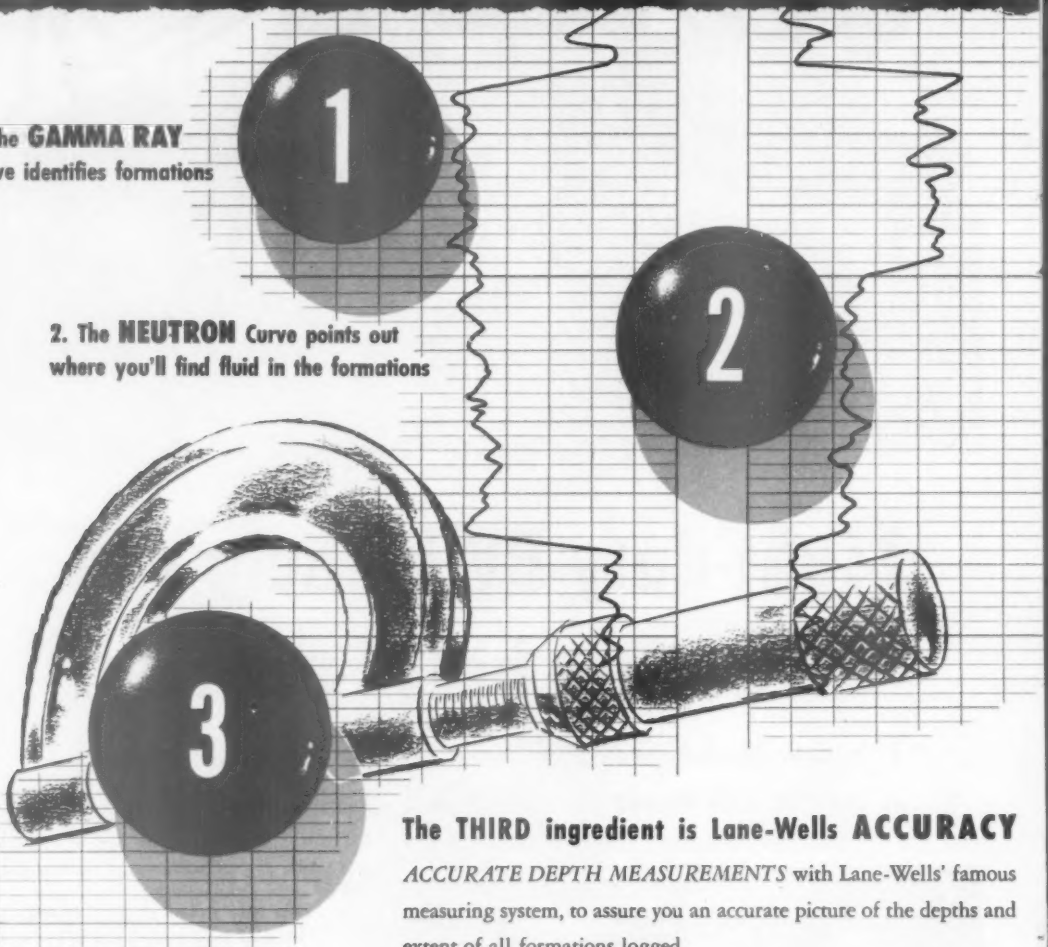

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THE OIL AND GAS
JOURNAL
TULSA, OKLAHOMA

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JOURNALLY Speaking

The Bad Old Days

WE recently read a book about the bad old days of Oklahoma and Indian Territory which rounded up a lot of lore and gore about the lawlessness and skulduggery which apparently were rampant back in those benighted times.

With great gusto the author recounted unvarnished tales of treachery during the Indian wars; of battles between cattle grazers and farmers; of light-triggered cowboys and gamblers; of railroad lobbying to get free right-of-way; of tricks pulled on the Indians to get their lands and tricks the Indians pulled on the White Men in applying for allotments; of cattle rustlers, train robbers, shyster lawyers, venal politicians, and other characters of similar unsavory ilk.

The major implication of the book was that all of that nature passed away with the Last Frontier, and now everything in Oklahoma is sweetness and light—legal, peaceful, equitable, fair, and aboveboard. Quite so, quite so. Certainly everything is that way in the oil industry.

But if present-day Oklahomans in general get a virtuous feeling by reading about the misdeeds of their forebears, we wonder if the oil industry wouldn't work up a righteous glow by a similar excavation of skeletons in its closet.

For example, not long ago we listened in on a couple of old timers reminiscing about some of the tricks that were pulled during the first attempts at oil conservation in Oklahoma, way back in the dim, dark ages, 20 years ago. It seems that running "hot oil" in violation of state proration orders was then considered an acceptable occupation and an intriguing game, a fair field for the employment of an oil man's inherent ingenuity.

Buried gathering lines and concealed pipe-line connections were a matter of course, and it was a very unimaginative operator who couldn't think up a way of running a well-potential test that would fool the state officials. A lot of money was spent in fancy measuring tapes that falsely gaged the volume of oil in a lease tank, and a popular, though short-lived, device was a well-head valve with left-hand threads that stayed wide open when the officials thought they had it sealed shut. And then when unitization came in, the "gerrymandering" of the boundaries of spacing areas beat anything a politician ever evolved for excluding a hostile precinct from his voting district.

All that kind of thing has gone by the boards, of course, and the ingenuity of today's generation of oil men is pitted solely against the forces of nature rather than against his fellow man and the forces of law and order. But some historian with a quirk for the seamy side of bygone days might be able to make quite a yarn out of such tales. And all the dirt wouldn't be on the doorstep of the old Standard Oil Trust, either.

Trade Lingo

THAT influential and high-minded organization, the Association of Petroleum Writers, has among its more noble purposes the objective of inducing newspapermen to use the proper terms customarily employed by the petroleum industry.

This campaign is bearing fruit. At least we have seen a couple of recent clippings which used oil-field terms correctly, and also dead pan.

One reported the completion of a well dug with a spade in the so-called Sunflower field of Mitchell County, Texas, close to the Coltex refinery at Colorado City, and read: The D. P. McCorcle No. 1 R. H. Ratliff was completed for a 10-hour pumping potential of 16.5 bbl. of 49°-gravity oil, plus 5 per cent water, from 2¾ ft. with top of pay picked at 2 ft. Completion was natural and no casing was run.

And just the other day workmen digging a basement for a department store in Oklahoma City punched a hole in a forgotten oil tank, and the reporter wrote: Crews plugged the hole and moved rig on the No. 1 John A. Brown Co. after production suddenly played out. Production was from 20 ft. in red clay.

—Henry D. Ralph

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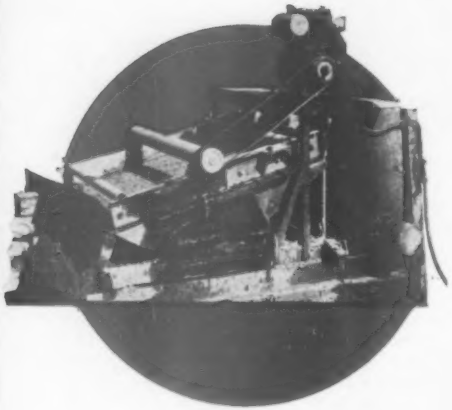

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THE OIL AND GAS
JOURNAL
Vol. 51, No. 3

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- Oil Possibilities in the Salina Basin
- How to Reduce Fishing Jobs, Extend Life of Drill Strings
- Low-Cost Removal of Sulfur Compounds from Motor Fuels
- Making Premium-Grade Motor Fuel in the Small Refinery
- Doswell Discovery Enhances Oil Possibilities of San Juan Basin
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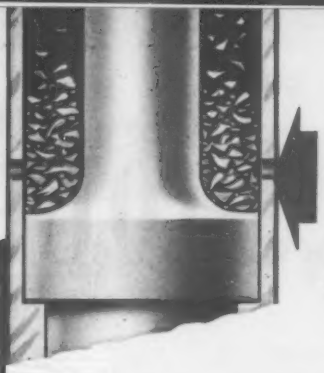
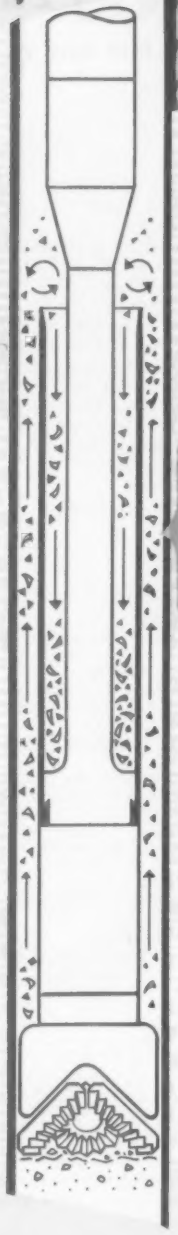


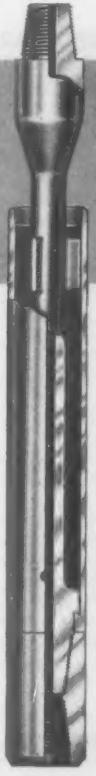
A "Booby Trap" for metal cuttings

Whenever you drill out cast iron, aluminum alloys, bronze, or other dense, but "drillable" materials, the improved Baker Junk Basket will prove an indispensable aid in trapping and retaining the cuttings for safe removal from the well.

Its design is simple, and readily understood by referring to the illustration at (right or left). Between the short Drill Collar (top) and the Drill Collar Sub (bottom) a Cylinder is mounted to provide a basket for trapping a considerable quantity of metal cuttings.



The BAKER JUNK BASKET



The Baker Junk Basket (Product No. 4281) is positioned just above the rock bit, or diamond point bit, when drilling out Baker Cement Retainers, Baker Bridge Plugs, Baker Production Packers, or other devices made of cast iron, aluminum alloys and similar "drillable" materials.

How It Operates

Cuttings from the drilling bit are carried upward by the high velocity of the circulation fluid through the comparatively small annulus around the Cylinder. When the circulation fluid reaches the top of the Cylinder, where the area of the annulus is abruptly enlarged due to the smaller diameter of the Drill Collar, the velocity of the fluid—and its power to carry cuttings upward—is greatly reduced. The metal cuttings accordingly drop out of the circulation fluid and into the basket (Cylinder) and are trapped and recovered when the drilling string is removed.

Available in Popular Sizes

The Baker Junk Basket is furnished to make up in 2⅜" to 4½" A.P.I. drilling strings, to run in 4½" to 9⅝" A.P.I. casing. Any Baker representative, or office will recommend the proper size for your needs, and see that you are promptly supplied on a rental basis. Specifications for purchase by over-seas operators can be found in the BAKER (or Composite) CATALOG.

BAKER OIL TOOLS, INC.
HOUSTON • LOS ANGELES • NEW YORK

Why this deafening silence?

THE oil strike is now settled, but what does the general public know about it? It knows approximately this:

... That a score of different unions conducted a long, noisy, and spectacular campaign for more pay.

... That the oil companies refused to meet the demands.

... That a strike resulted, causing some gasoline shortages and raising a scare of general tie-up of transportation.

... That the Government stepped in and "granted" an increase of 15 cents an hour.

... That the unions claim they forced the companies to the ropes and won a great victory.

... And that throughout the controversy all news articles were datelined Denver (union headquarters) or Washington and quoted union spokesmen, while not a word appeared in the press about the companies' position.

CLEARLY there was a breakdown in public relations. The oil industry is spending millions to get the public to understand it, but when the oil situation was front-page news and on everybody's tongue, the oil companies continued a policy of keeping quiet on labor matters.

If ever there was an opportunity to get industry's story before the public, this was it. By their silence the oil companies let the public infer that everything said about the labor controversy was true.

In similar labor crises in steel, coal, and other industries there are official or voluntary spokesmen who not only answer questions for the press but go out of their way to inform the public of the position of employers. Oil men have no valid reason to be so afraid of labor—or of the press—that they can't utter a word.

THE newspapers would have been eager to print—when oil was hot news—facts answering such questions as:

... How do oil wages compare with wages in other industries?

... Is the 15-cent raise commensurate with the increase in living costs?

... Would the workers' pay have been raised without a strike if it had not been for the Government's stabilization regulations?

... Can the companies easily afford this increase, or will it work a hardship?

... Will the increase have any effect on prices and profits, as in the current steel-wage controversy?

The industry's silence on such subjects has occasioned general wonderment. The explanation must be that the industry still hasn't learned anything about public relations.

THIS WEEK

WHO GETS THE ROYALTY from offshore operations such as this one in the Gulf of Mexico is expected to be known soon. The long-disputed question of ownership apparently will be resolved by the Senate. It will be determined by the lineup of senators when the roll is called on the question of overriding an expected presidential veto of a bill passed earlier by the Senate 50 to 35 and by the House 247 to 89.

STRIKE.—Threat of immediate and serious product shortages disappear as local negotiations settle labor disputes at most strike-bound refineries. . . . ¶Major exception is in aviation gasoline, which was in short supply before strike began. . . . Chapman says restrictions on avgas will remain for a while, with hopes for removal by June 3. . . . ¶Other products moving freely with demand firm. . . . ¶Plans for setting up local committees to solve shortage problems dropped by PAD as 15-cent pattern for wage-issue settlement spreads across industry. . . . All refineries expected to be back in operation in near future. . . .

DRILLING.—Hottest spot in Williston basin is still Beaver Lodge field in North Dakota. . . . So far seven producers have been completed, 13 more wells are being drilled, and 8 new locations have been staked. . . . Four Amerada extension attempts now are at critical testing depths. . . . ¶Los Angeles Harbor Commission, which has banned drilling on city harbor lands for more than a decade, may soon reverse its position. . . . Geologist is hired to survey harbor district's potential oil reserves. . . . Best prospect is thought to lie inside the Navy breakwater in the outer harbor. . . . ¶Navy planning deep test of pre-Cretaceous formations in Alaska, currently has five-well drilling program under way. . . . Future of drilling dependent on $8,700,000 appropriation bill now before Congress. . . .

EXPLORATION.—First of three wildcats prepares to begin drilling in test of deep zones underlying the big Eddy Unit in New Mexico. . . . The 14,500-ft. venture, 1 George H. Cobb-Federal, will explore deep formations under a 133,000-acre block owned by Richardson & Bass, Fort Worth. . . . Location is 38 miles south of Lovington and 11 miles southwest of Buffalo's recent Devonian discovery in Maljamar field. . . . ¶Permian basin geophysical exploration resulted in the drilling of 310 exploratory wells in West Texas during the first 4 months of the year. . . . 75 of these were successful, and these strikes, together with 28 more in the New Mexico portion of the basin, accounted for 36 new fields, 29 new pays, and 38 extensions, the Permian Basin Geological Society is told. . . .

INTERNATIONAL.—Gains in Kuwait and the United States contribute to new all-time crude-production mark by non-Communist world. . . . March figures, just compiled by the Journal, show production average 11,247,100 bbl. daily. . . . Production would have been even higher except for declines in Saudi Arabia, Venezuela, and Mexico. . . . ¶Sinclair organization gets concession over part of former Italian Somaliland in Africa. . . . Location adjoins the Ogaden area in Ethiopia where the company now is drilling. . . . ¶Pemex completes short 4-in. line from Rabon Grande field in southern Mexico to Minatitlan, Veracruz. . . . ¶Standard-Vacuum gets set to kick off preliminary exploration work on the island of Madagascar off the southeast coast of Africa. . . .

PRODUCTION.—Texas Railroad Commission's belief that surplus crude stocks should be reduced to normal levels brings slash in state's June crude-oil allowable to 2,847,875 bbl. daily. . . . ¶University of Texas' Bureau of Economic Geology to start soon on 3-year detailed study of the Ellenburger formation and associated rocks in Texas. . . . Project is being sponsored by five major oil companies. . . .

ACTIVITY.—Complete data on crude production for week ended May 17 are not available. . . . ¶Total well completions for the week increased 70 wells to 908. . . . Wildcat completions totaled 181 compared with 169 for previous week and 242 for same week last year. . . . ¶Rotary rigs operating in United States on May 19 decreased 9 rigs from previous week to 2,838. . . .

TRENDS.—Total crude inventories climbed to 276,897,000 bbl. on May 10, the highest level since April 1941. . . . Gains for 2-week period ended May 10 amounted to 12,116,000 bbl. . . . Texas crude accounted for 9,045,000 bbl. of the increase. . . . Additional increases are indicated for week ended May 17. . . .

PIPE LINES.—Laying of pipe scheduled to start by June 1 on eastern section of Trans-Mountain Oil Pipe Line Co.'s $80,000,000 crude-oil line from Edmonton, Alta., to Vancouver, B. C. . . . Road construction well under way along route. . . .

Plants Reopening

Fears of product shortages fade as workers return; big exception is aviation gasoline, still a critical problem

OIL refineries and other installations which had been struck since April 30 were getting back in operation one by one last week as individual labor contracts were negotiated on the pattern of a general increase of 15 cents an hour in basic wage rates.

At some plants there were delays due to bargaining over secondary issues. There was rather general acceptance of shift differentials of 6 cents an hour more for the evening shift and 12 cents for the midnight shift.

The question of retroactive increases was causing delays in some instances, as the amount involved and the length of time differed with each contract. Another bone of contention was the period of the contract, as most unions have asked a reopening for new negotiations within 6 months.

On the West Coast, which was not actually struck, the writing of new contracts was held up by the attempt of several companies to increase wages on a percentage basis which would average 15 cents an hour but would not give a flat 15 cents to each worker.

The general expectation, both in company and union circles, was that virtually all individual negotiations would be completed in a few days, even though only about one-third of the struck plants were back in operation at the week's end.

Market outlook . . . Resumption of work in many refineries and the prospect that the entire industry would soon be operating at capacity brought an end to the fear of a serious and immediate shortage of petroleum products, and permitted the federal Government to lift some of its emergency controls on distribution. Aviation gasoline, however, will continue to be in very short supply for some time to come.

Gasoline and most other products were in strong demand and moving freely last week. Prices were firm and in most cases were at or close to OPS ceilings.

There still were no dependable statistics on refinery production during the period when about one-third of the nation's capacity was shut down, nor on stocks of refined products. But it was apparent that maximum refinery activity would be required for many weeks or months to make up for the loss.

Emergency plans dropped . . . In Washington, officials of the Petroleum Administration for Defense said that the aviation gasoline supply will be limited for an undetermined period which will be measured in weeks rather than days.

The brightening supply situation made it unnecessary for PAD to set up the fact-finding committees and procedures for dealing with spot shortages of motor gasoline and other consumer products which had just been approved by the Department of Justice. It also paved the way for revocation of orders issued during the strike restricting deliveries and requiring a set-aside of gasoline stocks for possible emergency distribution to vital transportation facilities.

The first step in that direction was the lifting of restrictions on package and tank-truck shipments of the principal products and railroad tank-car shipments of all products but aviation gasoline, mainly releasing shipments to Canada and Mexico. Tanker and barge shipments were kept under control.

Another relaxation eliminated restrictions on the quantity of grade 91-98 aviation gasoline deliverable in the three West Coast states, Alaska and Hawaii for flights made in or between those areas. PAD explained that those areas are more reliant on air transportation than other sections of the United States and the production of this grade will not appreciably reduce the quantities of alkylate available for making the higher grades of aviation gasoline.

Avgas restrictions . . . In all other respects, however, the limitations on the delivery and use of aviation gasoline made necessary by the strike were kept in effect and PAD announced they would be strictly enforced.

The need for the 30 per cent cutback in consumption of aviation gasoline was explained by Interior Secretary Oscar L. Chapman.

Chapman pointed out that shortages of aviation gasoline have threatened ever since the Communists invaded South Korea and supplies were inadequate even before the strikes.

"Now the strikes in the petroleum industry have made a bad situation worse," Chapman said. "The amount of aviation gasoline already lost through plant shutdowns amounts to more than 1,000,000 bbl.—enough to supply this country's civilian needs for more than a month."

The loss of this production, he warned, will probably delay the revocation of orders issued by PAD last fall to increase output by regulating the use of certain components, which it had been hoped could be dropped by next October.

Chapman pointed out that some time will be required to get shipments moving in volume, largely because components cannot be obtained until all the major units of each refinery are in production and necessary stocks have been accumulated. The minimum lapse between the starting up of a refinery and actual production of aviation gasoline will be about 7 days, PAD estimated, and in many cases even longer.

"In view of all these circumstances," the secretary declared, "it is obvious that restrictions on the use of aviation gasoline cannot be relaxed now or for an unpredictable number of days to come."

However, he added, it is hoped it will be possible to remove the limitations by June 3, the present expiration date of the order.

Production Makeup Allowed

BATON ROUGE. — The Louisiana Conservation Department last week issued special orders permitting the state's oil operators in some cases to make up in May any production lost because of the oil strike.

The orders were issued by Commissioner S. L. Digby following a conference here between conservation officials and about 40 operators and producers. They did not refer directly to the strike.

The action was taken because the decrease in market outlets during May forced the commission to restrict production from capable wells in order to permit continued production of marginal wells, which might have been lost if production had been suspended.

The orders permitted operators to make up production of restricted wells by producing during the remainder of the month quantities "equal to the amount per well per day multiplied by the number of days in the month."

Production allowables ordinarily are set on a daily basis in Louisiana, and no makeup is permitted for temporary cutbacks.

ANSWER MEN at one of the Rensselaer oil-forum panels included, left to right, Herbert Spencer, president of the Asphalt Institute; Dave Shepard, director of Standard Oil Co. (N. J.); Earl Newsom, public-relations counsel, New York; Harold B. Fell, executive vice president of the Independent Petroleum Association of America; N. S. B. Gras, editor of The History of Standard Oil Co. (N. J.); S. A. Swensrud, president of Gulf Oil Corp.; W. F. Briggs, president of Valley Oil Co., Inc.; B. E. Hutchinson, vice president of Chrysler Corp.; and N. J. Cyphers, vice president of Hamilton Rubber Co., Inc.

Teachers Get Briefing

Oil's labor, tax, pricing, foreign-relations, and other problems explained to 650 educators at New York meeting

Dahl M. Duff

TROY, N. Y.—Practically the entire field of current oil-industry problems was rehashed and discussed in three panel sessions by between 40 to 50 oil men and about 650 members of the teaching profession here at a meeting May 16-18.

The meeting was the first of a series sponsored by Rensselaer Polytechnic Institute to provide better understanding of various branches of American industry. It was noteworthy more as a public-relations effort than for the new information it developed regarding the industry.

Mostly in the social sciences, the school teachers and college professors were gathered in Troy as guests of the Industrial Council, which Rensselaer Polytechnic organized several months ago. The council is financed by 38 corporations, including 10 oil companies. The oil session was the first of the semiannual programs which will cover every major industry.

Most of the oil men present, all company officials, were on the answering side of the panel. It was apparent that the meeting was valuable in clearing up misconceptions regarding petroleum which were held by many of the teachers. It also was apparent that the industry could have profited even more through greater company attendance, more active participation, and use of exhibits and literature.

Middle East relations . . . Principal speaker at the meeting was Trygve Lie, secretary general of the United Nations, who warned that oil relations in the Middle East must be solved on the basis of a "fair and equal partnership." Anything less, he said, will result in "endless friction and trouble."

Lie was partial neither to Iran nor to Britain. He did not touch on the sometimes-heard suggestion that the U.N. supervise and umpire the oil industry of the Middle East.

He did say that the U.N. approach and the assistance of its related agencies offer a good chance of reaching a fair and peaceful solution of the Iranian nationalization. He pointed out that the case is still before the Security Council awaiting a preliminary decision on legal aspects by the International Court of Justice.

"The Middle East needs Western techniques and capital in the development of its oil industry," he said. "At the same time, nationalism is a strong and growing force in this whole area, and nationalism exists side by side with widespread poverty and a growing demand for economic development for the benefit of the people. In this situation a far-sighted policy aimed at partnership on a fair and equal basis with these countries will bring rewards to all concerned. . ."

Here are the oil representatives' views on some of the industry's problems:

On the oil strike . . . The real issues were not wages and shift differentials but rather national vs. local or plant bargaining and government intrusion into the industry's labor affairs.

Industry capacity is adequate to make up what has been lost, though there may be some difficulties in getting products into certain areas this winter.—L. F. McCollum, president, Continental Oil Co.

The oil companies are resisting union efforts for national bargaining such as in steel or coal, because it would be unhealthy for the national economy. Union strength is concentrated in refining. Gulf, with 35,000 employes, has 20 per cent union members.—S. A. Swensrud, president, Gulf Oil Corp.

On industry competition . . . Prolonged price control would be the death of the independent in the industry. Wartime controls decreased the proportion of production of the independents and increased that of the major operators.—H. B. Fell, executive vice president, I.P.A.A.

With a product where the quality is so generally comparable as gasoline, it is only natural that prices converge on a common level. This shows more competition, not a lack of it.—John Harper, chairman, National Oil Jobbers Council.

On taxes and trends . . . The total tax bill on the industry last year amounted to about 6.6 billion dollars, or approximately a third of its gross income. Government took about $8 for each $1 paid out to stockholders. Taxes can destroy the process of capital formation. The greatest danger in the country at the present time—short of war—is inflation, which in the long-run is destructive to any industry like oil. New forces are arising this year that are even more ominous. The moment the two factors—expansion of profits and expansion of money supply—diverge, the mechanism of capital flow is endangered.—Joseph E. Pogue, oil consultant, Chase National Bank.

On foreign operations . . . Present reserves in the Middle East approximate 60 billion barrels as against about 32 billion in the United States. The United States is presently importing 150,000 to 200,000 bbl. daily from the Middle East, and no great increase is likely in the foreseeable future. Present rela-

PANEL PARTICIPANTS in another question-answer session included, left to right, Frank B. Appleman, Fort Worth attorney; Joseph E. Pogue, oil consultant, Chase National Bank; V. W. Fries, vice president of White Motor Co.; Carl A. Gerstacker, director of Dow Chemical Co.; Edward T. McCormick, president of the New York Curb Exchange; J. R. White, executive vice president of Imperial Oil, Ltd.; W. D. Heath Eaves, United States representative of Anglo-Iranian Oil Co., Ltd.; and Albert J. McIntosh, economist, Socony-Vacuum Oil Co., Inc.

tions of the oil companies with the host governments abroad are good. —Dave Shepard, director, Standard Oil Co. (N.J.).

In operations abroad, the oil companies pay the royalty and taxes to the existing governments and do not have the right to say how the money should be spent. These are sovereign governments, and though the industry does what it can, it should not be censured for any lack of wisdom in the use of the oil revenues by the government. The activities of the companies themselves as well as expenditures of the governments already have raised the standard of living and brought about improved conditions in many areas of foreign oil operations. — Richard J. Gonzalez, economist and director, Humble Oil & Refining Co.

Rank Wildcat Finds Oil

NEW ORLEANS.—Second producing well in Livingston Parish was brought in last week. A joint operation of The Texas Co. and Progress Petroleum Co., the well flowed at a rate of 220 bbl. daily of oil and water, equally divided, through a 9/64-in. choke.

The successful wildcat, the 1 Juban, is expected to renew interest in the so-called Florida parishes north of here, a large area in which, unlike most of the rest of the state, little oil has been found.

Production was from 8,591-97 ft. Location is in Section 4-7s-3e.

Depletion Boost

Producers must pay for dry holes, also, Gonzalez says

KANSAS CITY.—The depletion allowance is essential since operators must look to successful wells to recover not only the capital invested in them but also the money lost on dry holes, Richard J. Gonzalez, a Humble Oil & Refining Co. director, told the Oil and Gas Symposium sponsored here by the University of Kansas City.

"An average producing well must pay not only for itself but also for two-thirds of a dry hole," Gonzalez said, since two dry holes are drilled for every three producers, and for its pro rata share of exploration costs."

"Only after the successful well returns such expenditures plus its own operating costs will any real profit be realized," Gonzalez said.

On the basis of 1951 experience, he said, drilling odds are these: eight dry holes against one producer for new-field wildcats; two and a half dry holes against one producer for extensions and new zones; one dry hole against three and one-half producers for development drilling; two dry holes against three producers for all drilling.

Answering arguments that operators, but not major companies, should be allowed percentage depletion, Gonzalez said all operators encounter exactly the same risks "regardless of the scale of their operations."

Companies drilling many wells are bound to get some production, but there is no assurance the amount of oil found will be in proportion to the money risked, he said.

Unlike insurance companies, which deal with mortality tables and pay off in proportion to the premium charged, he said, oil producers "are risking billions of dollars without any assurance with respect to the amount of barrels they will find, develop, and produce over the next 20 years or the money which will be realized from such operations."

Plug for Safety

It saves small contractors money, too, consultant says

DALLAS. — Mechanics of a safety program for the small drilling contractor are little different from those of the major contractor.

Addressing the seventh annual Drilling Industry Safety Clinic of the American Association of Oilwell Drilling Contractors, Gordon Oliver, Odessa consultant, said contractors with five or fewer rigs still are big enough to need a safety program.

Even though a contractor may be operating one rig, Oliver said, he still employes as many men on that rig as he would on each of his other rigs if he were operating more. The men are handling no more and no less equipment, he added, so each crew must stand on its own.

Payoff in a successful safety program, the consultant told the drilling men, lies in the reduction of compensation insurance premiums and medical costs.

Additional benefits include a reduction in labor turnover, better housekeeping, better maintenance of equipment with less major overhaul, and better public relations and reputation in general among operators and fellow contractors.

Program organization.—Safety programs should be started in a conference with the company's top man, making his support of the program obvious.

Actual program then could be worked out in supervisory meetings. A review of accidents which have occurred for several months previous will determine where work should be started, Oliver said.

Most effective meetings, the safety engineer said, are those held on the rigs, and these rig conferences can either make or break the safety program since support of the men on the rig floor is essential to the success of the program.

Trend in Consumption

Gasoline sales show jump of nearly 46 per cent during 5-year period just ended; California still leads nation

THE largest relative increases in gasoline consumption since the end of the war have been in the southeastern states. This trend is shown in the tabulation of gasoline consumption by states which is compiled by the Department of Statistics of the American Petroleum Institute. Data for 1951 were released about the middle of May.

Every southern state on the East Coast starting with Maryland had an increase of more than 50 per cent for the 5-year period through 1951. Total consumption for the 8 states, including West Virginia, amounted to almost 5.4 billion gallons in 1951 for a gain of 60.7 per cent since 1946.

Only four states had increases greater than 60 per cent for the 5-year period, and three of these were in the southern part of District 1. Florida led the list with a gain of 68.7 per cent followed by North Carolina with 67.0 per cent. Virginia's increase of 63.8 per cent was only slightly less than the increase of 63.9 per cent in Alabama.

Consumption in the New England states moved up 36.2 per cent compared with a gain of 45.9 per cent for the country as a whole.

In the accompanying table the states are arranged into groups representing PAD districts. The largest increase under this grouping was in District 3, up 56.4 per cent. The smallest was in District 5 where the increase was 39.9 per cent. In District 5, only the inland states of Arizona and Nevada had gains greater than 50 per cent.

Districts 1 and 2 combined had total gasoline sales amounting to 30.65 billion gallons in 1951 or 69.8 per cent of total United States consumption. The largest volumetric gain for the 5-year period was reported for District 2, a jump of almost 4.9 billion gallons.

California heads list . . . California continued in first place with total sales of about 4.4 billion gallons in 1951. California replaced New York as the leading gasoline-consuming state in 1941 and has held first place since that time except for the years 1943 and 1944, when military purchases pushed Texas sales above all others.

However, the gain in Texas consumption for the 5-year period was slightly greater than of California, 1.25 billion gallons for Texas compared with 1.22 billion for California.

There were 13 states with sales exceeding one billion gallons in 1951. In this group, three states had postwar increases greater than 50 per cent. These were North Carolina, Missouri, and Texas. Massachusetts and California were the only major states with increases less than 40 per cent.

Sales in the 13 major states totaled almost 27 billion gallons in 1951 or about 61 per cent of total consumption in the United States.

The A.P.I. report also indicated that peak consumption for 1951 came in August when sales reached 4.1 billion gallons. October and July ranked second and third respectively.

GASOLINE CONSUMPTION IN UNITED STATES
(Thousands of gallons)

	1946	1951	Increase Volume	Increase Per Cent
Maine	184,571	240,176	55,605	30.1
New Hampshire	103,681	138,709	35,028	33.8
Vermont	77,291	100,644	23,353	30.2
Massachusetts	750,258	1,023,369	273,111	36.4
Rhode Island	135,631	182,642	47,011	34.7
Connecticut	384,544	541,920	157,376	40.9
New York	1,945,783	2,787,670	841,887	43.3
Pennsylvania	1,661,487	2,370,928	709,441	42.7
New Jersey	935,235	1,396,711	461,476	49.3
District of Columbia	145,745	206,276	60,531	41.5
Maryland	380,306	586,560	206,254	54.2
Delaware	69,959	108,801	38,842	55.5
West Virginia	260,900	393,500	132,600	50.8
Virginia	561,416	919,424	358,008	63.8
North Carolina	636,469	1,013,242	376,773	59.2
South Carolina	311,883	520,751	208,868	67.0
Georgia	542,602	853,682	311,080	57.3
Florida	571,651	964,118	392,467	68.7
Total District 1	9,659,412	14,349,123	4,689,711	48.6
Ohio	1,627,797	2,351,067	723,270	44.4
Michigan	1,455,290	2,080,465	625,175	43.0
Kentucky	409,963	615,214	205,251	50.1
Tennessee	496,755	769,751	272,996	55.0
Indiana	888,643	1,309,535	420,892	47.4
Illinois	1,643,919	2,375,678	731,759	44.5
Wisconsin	738,863	1,035,218	296,355	40.1
Minnesota	711,864	946,217	234,353	32.9
North Dakota	228,216	270,218	42,002	18.4
South Dakota	209,640	287,350	77,710	37.1
Iowa	749,924	975,960	226,036	30.1
Nebraska	327,428	489,310	161,882	49.4
Missouri	814,968	1,265,790	450,822	55.3
Kansas	596,464	786,355	189,891	31.8
Oklahoma	524,668	743,080	218,412	41.6
Total District 2	11,424,402	16,301,208	4,876,806	42.7
Texas	2,264,143	3,514,073	1,249,930	55.2
New Mexico	163,768	250,856	87,088	53.2
Arkansas	274,793	425,010	150,217	54.7
Louisiana	376,360	600,705	224,345	59.6
Mississippi	305,089	472,139	167,050	54.8
Alabama	393,705	645,238	251,533	63.9
Total District 3	3,777,858	5,908,021	2,130,163	56.4
Montana	175,235	232,373	57,138	32.6
Wyoming	94,629	141,039	46,410	49.0
Idaho	147,860	210,222	62,362	42.2
Utah	150,066	225,753	75,687	50.4
Colorado	338,129	492,913	154,784	45.8
Total District 4	905,919	1,302,300	396,381	43.8
California	3,169,368	4,390,157	1,220,789	38.5
Arizona	171,519	267,987	96,468	56.2
Nevada	59,810	91,640	31,830	53.2
Oregon	380,781	546,901	166,120	43.6
Washington	527,593	731,390	203,797	38.6
Total District 5	4,309,071	6,028,075	1,719,004	39.9
Total United States	30,076,662	43,888,727	13,812,065	45.9

Advice to Critics

If you dislike government, help run it, Brown suggests

BOSTON.—A plea for a better and more sympathetic understanding by government and industry of each other's problems was made here last week by Bruce K. Brown, deputy administrator of the Petroleum Administration for Defense, in a speech at the spring meeting of the American Petroleum Institute's Division of Marketing.

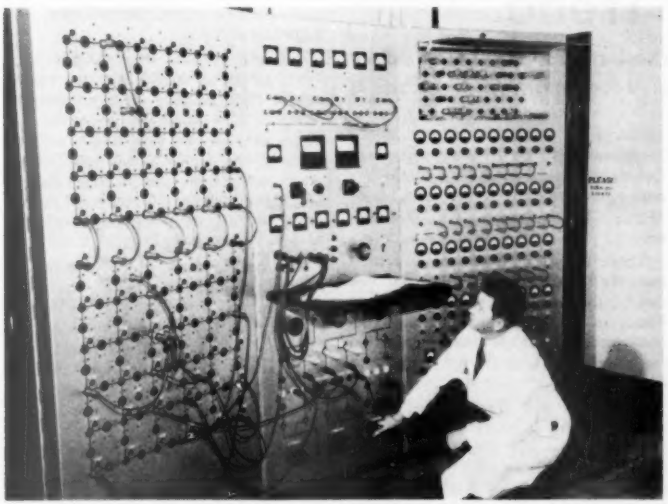
To a considerable extent, better relations are blocked by what Brown called "static" on both sides. For business, this is created by those who take a dim view of any government activity aside from the postal service and the armed services. For men in government, it is usually set up when some federal employe takes an extreme position on business activities.

Citing the "queer paradoxes" that flow from this lack of understanding, Brown said "it is not easy to explain why oil companies venturing abroad should be damned as part of a vicious cartel when many of their actions in recent years were supported by the State and Defense departments as essential to national security."

"Naturally, such incongruities dismay business men," he said. "But this dismay isn't confined to them. Government officials become just as disheartened when intemperate personal attacks are made on them for trying to carry out policies, national and international, that have received the direct endorsement of Congress."

Brown asked that oil men watch the executive branch of the government in action from day to day and "help where they can." They should volunteer personal service as needed, not only in oil but in other fields such as transportation and agriculture and many others "which could use a leavening of petroleum thinking."

In another talk at the marketing meeting, P. C. Spencer, president of Sinclair Oil Corp., recommended that the oil industry solve its troubles "within the family" "rather than to go tearing down to Washington . . ." He asked for the utmost support of the Oil Industry Information program and said that much of the success of this public-relations effort depends on the marketers—the salesmen of the industry who are in most direct contact with the public.



Solves Pipe-Line Flow Problems

This complicated instrument is proving a time-saver in giving pipe-line engineers answers to questions involving choice of best pipe-line locations, selection of pipe diameters, effect on flow of varying elevations of storage tanks, and evaluation of pressure variations. The 7-ft. panel, recently installed at Midwest Research Institute, can solve problems involving a system of as many as 104 lines within half an hour. Left panel represents a variety of possible network layouts. Brightness of tungsten filaments in bulbs indicates which lines are operating with greatest pressure losses, giving values of flow and pressure drops for lines varying in length, diameter, and roughness. Center panel indicates flow rate in any line and gives friction loss between any two junctions. Right panel contains equipment to simulate 43 loads of any desired flow rates. Only two other such instruments exist in the country at present.

CANADA

Trans-Mountain Start Near

EDMONTON, Alta.—Laying of pipe is scheduled to start by June 1 on the eastern section of Trans-Mountain Oil Pipe Line Co.'s $80,000,000 crude-oil pipe line from Edmonton to Vancouver.

Charles Rathgeb, Jr., vice president of Comstock Midwestern Co., Ltd., contractors of about 474 miles on the eastern and western ends of the 695-mile, 24-in. line, said his firm has set up operating headquarters for the eastern section in Red Pass Junction on the Canadian National Railways West Coast line. A "good-sized town" already has been established there, Rathgeb said.

Road construction has started along the pipe-line right-of-way, and a 43-mile road has been opened from the resort town of Jasper, Alta., to Red Pass Junction.

Rathgeb was accompanied recently on an inspection of the route by John H. Burroughs, general pipe-line superintendent, and C. E. Baker, construction manager, for Canadian Bechtel, Ltd., agents for Trans-Mountain.

Contract for the 221-mile middle section of the line is held by Mannix, Ltd., which has set up headquarters at Kamloops, B. C.

Sun Buys New Refinery Site

SARNIA, Ont.—Sun Oil Co. has sold its 125-acre refinery site here to Dow Chemical Co. of Canada, Ltd. At the same time, Sun bought Dow's 200-acre site to the south of its original site.

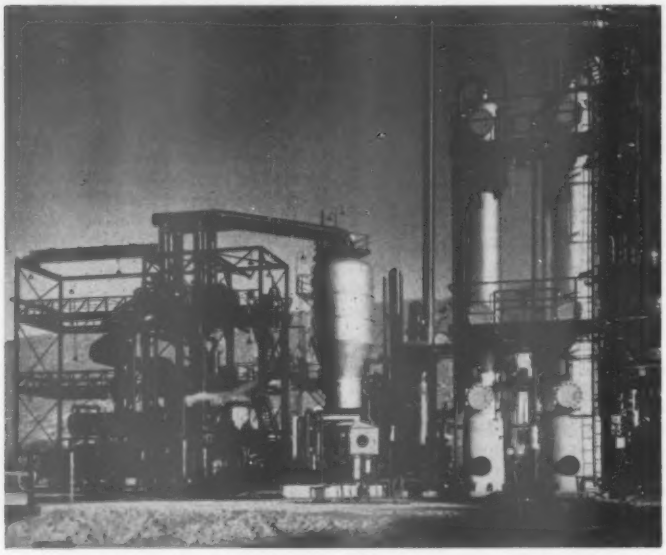
Sun has begun clearing its newly acquired site and plans to begin construction work soon. The company expects to complete its new refinery in about 15 months.

Fluid Cracker in Operation

SARNIA, Ont.—Ontario's first fluid catalytic cracking unit, that of Canadian Oil Cos., Ltd., at Froomfield has gone on stream.

The cat cracker is the major processing unit in the company's new $22,000,000 refinery, which is expected to be in full operation early this summer.

The refinery will produce aviation-gasoline base stocks, and jet fuels as well as automotive gasolines, distillate oils, heavy fuel, and other products. Butylenes will be piped to the nearby government-owned Polymer Corp. synthetic-rubber plant, and ingredients for synthetic chemicals will be piped to the adjacent plant of Dow Chemical of Canada, Ltd.



LESS RESIDUAL and more light products are obtained by this new 9,500-bbl. vacuum flasher of Salt Lake Refining Co., which permits a deeper cut for catalytic cracking stock.

New Refining Trend

Smaller yield of heavy cracked stocks is goal of Rocky Mountain refiners, since heavy-fuel markets are fading

George Weber

CASPER. — The steadily dwindling demand for heavy fuel oil in the Rocky Mountains is causing refiners in the area to plan adjustments in their plant operations.

The general trend will be toward obtaining a deeper cut from the crude barrel for catalytic and thermal cracking and toward reducing to a minimum the yield of heavy cracked stocks.

Plant construction during the next several years will include new facilities for vacuum distillation, coking, visbreaking, and possibly propane deasphalting, in addition to moderate expansion of crude charging and catalytic cracking capacity.

There also is much interest among refiners of the region in catalytic reforming. Although the altitude of their market area gives them a natural advantage in the octane race, refiners foresee a gradual increase in gasoline antiknock quality and are now considering the measures they must take to meet competition.

Over-all picture . . . Forty-four plants are now in operation in the Rocky Mountain refining region embracing Colorado, Idaho, Montana, Utah, Wyoming, and sections of Nebraska, New Mexico, South Dakota, and Washington.

These operating plants have a total capacity for charging 274,340 bbl. per day of locally produced crude. Many plants in the Wyoming-Montana area are operating below capacity, while the reverse is true in the Salt Lake City area.

More than half the refineries in the region consist of older installation of small capacity and limited processing facilities. For example, 24 have capacities of less than 5,000 bbl. per day and 11 are in the 5,000 to 10,000-bbl. class. The remaining eight plants with capacities from 10,000 to 27,000 bbl. per day constitute over 60 per cent of all crude capacity and nearly all of the catalytic cracking capacity.

With some exceptions, these larger refineries will carry the bulk of new process modifications.

As a class they are well above average in modern processing. All refineries in the region, including the smaller skimming plants, show a ratio of catalytic cracking capacity to crude capacity equal to the national average, although they fall short in thermal cracking.

High freight rates in the region tend to protect some smaller refiners in their immediate market areas, but it appears that the number of operating plants with a capacity under 5,000 bbl. will continue to shrink. Twelve small plants have been abandoned in the past year or more, and five additional skimming plants were shut down during the same period. These are located mainly in Montana and Wyoming.

Outlook in gasoline . . . Rocky Mountain refiners are marketing the equivalent of the best antiknock gasoline in the nation today.

In the northern sector, last month's premium-grade fuel averaged 89.2 research octane, and southern Rocky Mountain plants were marketing 88.4 octane premium gasoline on the average. Regular grades averaged 80.0 in the south and 81.2 in the north. Some refiners are producing 90 octane premium and better than 82 housebrand fuels.

Altitude of the area ranges from 4,000 to more than 7,000 ft., which means that gasoline with a research rating 3 to 6 numbers below the national average will work just as well there as the higher-octane gasoline in other parts of the nation. Thus Rocky Mountain motorists already are being provided fuel with the best performance in the nation.

The octane race, which is expected to be resumed vigorously elsewhere this summer, will probably not be too evident this summer in this area because of the high quality refiners have maintained. However, some of the market centers such as Salt Lake City and Denver may see some upward movement in octane.

The long-range prospect, say refiners, is the same as for the country as a whole—a gradual rise in antiknock quality. Further evidence of the present high quality of gasoline in the area is the spread between marketers competing in the same area. In Salt Lake City, for example, premium octanes vary over two numbers and regular ranges through a spread of about 1½ numbers. Those refiners marketing at the lower octane ranges report no complaints from customers or sales departments.

Gasoline stocks are high throughout the area, but refiners indicate no alarm. The coming tourist season is expected to top all previous records and heavy withdrawals from storage are just beginning. Although most larger refiners with catalytic cracking facilities retain some margin on octane, there is widespread interest in catalytic reforming for improving gasoline quality. No such units have yet been contracted, and few, if any, will be built as part of the aromatics program due to the type of crudes processed.

When restrictions on construction of such units are modified, several catalytic reforming units will doubtless be incorporated into Rocky Mountain refineries. Meanwhile, catalytic cracking is being expanded with four new units now building or planned and several expansion programs under way for increasing capacity of existing units.

Middle distillates . . . The rapid dieselization of railroads has greatly affected operations in this region.

Many of the railroads traversing the area have completed their conversion from coal and fuel-oil burners to diesels, and the remaining roads are approaching complete conversion. Railroads are fairly rigid in their specifications, demanding and getting for the most part a 100 per cent straightrun diesel fuel.

Truckers, particularly those operating long-haul fleets across the Rockies, also are converting rapidly to diesels. Road construction and earth-moving equipment engaged in state road projects and federal reclamation and defense programs contribute further to the local diesel demand.

Proportionally, the swing from heavy fuel to diesel is probably greater in this area than in any other region in the nation.

Heavy-fuel problem . . . While the increased diesel-fuel business puts a strain on the supply of middle distillates needed for cat cracking feed stocks and for a good seasonal burning-oil market, the effect of dieselization is more severely felt in the loss of heavy-fuel markets.

The residual problem is acute in some localities, where outlets have dried up completely. The situation is not uniformly bad, however. Heavy fuel is moving well in the Salt Lake area, due mainly to industrial and power demand. Mining, smelting and other scattered industrial installations provide good outlets for some refiners located nearby. Decentralization of industry is bringing in some new consumers, but not enough to reverse the trend.

Natural gas in the future will cut further into fuel-oil markets. Increased reserves of gas will receive outlets to the bigger cities, where eventually they are expected to saturate the domestic needs. Some refiners today are clearing their fuel-oil stocks supplying industries which are already provided interruptible gas service. It is considered a matter of time before this outlet disappears.

Asphalt picture . . . Fortunately for refiners of the region, paving asphalts and road oils are in firm demand throughout the mountain states.

The potential demand for the future remains strong, since the states have a lot of catching up to do in new construction and maintenance.

The mountain states are progressive in their road-building programs, and petroleum products capture a predominant share of the paving materials market in the region. This proves an advantage of the small refiner processing the so-called "black" or sour crudes so prevalent in the area, as sulfur does not degrade such products.

State highway departments, however, have become highly selective in their specifications. Most states use the negative spot test for road asphalts and oils, which tolerate very little cracked stocks. This insistance on a high straightrun content is not unanimously agreed to be necessary, however, as one state has permitted the use of road-oil blends containing relatively large amounts of cracked stocks, and the highways of that state are said to have proved as serviceable as those of the other states.

Here, again, the tendency to insist on specifications which may be unnecessarily rigid may be working to the disadvantage of the consumer because of the limit of supply and the consequent higher price which must be paid for special products. Some refiners feel that 100 per cent virgin asphalts and road oils, like the straight virgin diesel fuels, are not uniformly necessary and that a modification of specifications to permit the blending of some cracked stocks together with certain additives, where necessary, will result in mutual benefits to supplier and consumer.

Coking situation . . . Although virgin asphalts and heavy road oils find a ready market, the Rocky Mountain refiner is still faced with the problem of disposing of heavy thermal tars and heavy cycle stocks formerly absorbed as heavy fuel. The principal outlet seems to be coking.

About half of the major refiners in the area have coking facilities ranging from antiquated shell stills to modern delayed cokers. The necessity for coking at present, and the time schedule when other refiners expect to adopt that practice, vary widely from section to section.

In the Casper area, for example, local railroads are completely converted to diesels and two of the three local refineries are coking their cracked residual stocks. Refineries on the Union Pacific right-of-way still have an outlet for their heavy fuels. One such refiner has coking facilities which are not presently used and another is seriously considering installation of coking facilities.

The Salt Lake section is for the time being well off on heavy-fuel outlets, but refiners anticipate that some time in the future they may have to resort to coking or some other means for disposing of residuals.

It appears likely that several modern coking units will be installed not only by refiners without such facilities, but also by some operators using outmoded coking units. Refiners are highly interested in the new continuous contact coking process.

Other processing . . . Propane deasphalting is practiced by two refiners in the region who are highly satisfied with the operation. It produces a prime asphalt product and permits a deep cut in the reduced crude fraction for catalytic cracking feed stock.

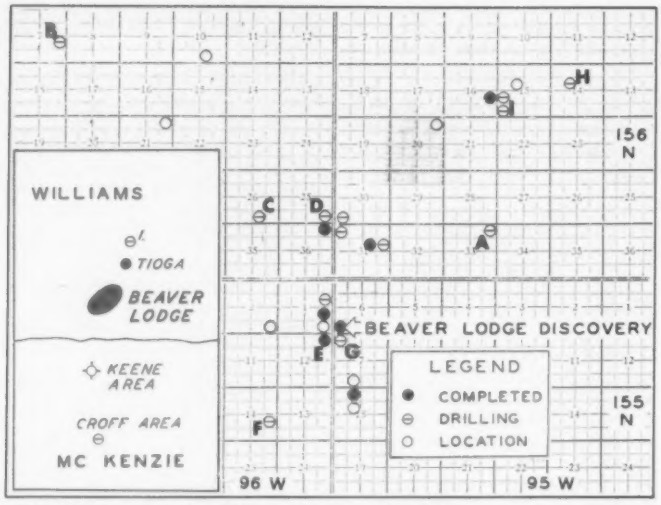
The use of vacuum distillation to provide a deeper cut into the residual fraction for catalytic cracking feed stock, is also on the increase in the area. Some refiners have already added or extended vacuum operations to permit expanded cat cracking and in some cases, greater crude runs. New developments believed forthcoming shortly in this technique are being awaited with considerable interest by refiners of the region.

Although plant investment in Rocky Mountain refineries will continue to be relatively modest by comparison with new construction elsewhere in the nation, the refiner of this region will continue to modernize and expand to a limited extent. The trend will be toward fewer, larger plants which will compare favorably with the national average in a well-balanced processing operation.

New Firm to Enter Search

CASPER, Wyo.—A new firm, Canada Southern Oils, Inc., has been organized to search for oil in the Powder River basin, Denver-Julesburg basin, and Williston basin areas.

Cecil V. Hagen, president, said exploration activities of the company, a United States subsidiary of Canada Southern Oils, Ltd., would be under the direct supervision of James L. Ballard, chief geologist. Headquarters will be in Casper.



DEVELOPMENT OUTLINE of Beaver Lodge area with inset showing relation of nearby areas.

Beaver Lodge Growing

Field now has seven producers; four extension tests are at critical depth and nine additional wells are drilling

WILLISTON. — Hottest spot in the Williston basin is still Beaver Lodge field.

To date seven producers have been completed. Thirteen more wells are drilling, and eight new locations have been staked.

Last week four Amerada Petroleum Corp. extension wells were at critical testing depths. These included: the 1 Alvin Iverson (F on map), which was preparing to perforate and test the Madison; the 1 P. O. Iverson (G), which had run production string; the 1 Peter Larsen (H), preparing to test after recovery of 2,100 ft. of oil from 8,523-53 ft.; and the 1 Heen (I), where the company was preparing to run casing.

Two more extension tests, important because of their location, were continuing to core and drill. They are Amerada's 1 Nels Odergaard (A), a northeast extension, and Champlin Refining Co. 1 Tank (B), which is seeking production to the northwest.

Two important Amerada wildcats also were drilling. They are the 1 Herfindahl (C), which was below 5,580 ft., and the 1 Fretland (D), which swabbed small quantities of gas-cut mud following acid treatment of perforations between 8,660 and 8,675 ft.

Most recent Amerada completion in Beaver Lodge is the company's 1 Almer Iverson (E), which flowed 22 bbl. per hour from 8,572-94 ft.

Activity was high also in the areas north and south of Beaver Lodge (see inset map).

Croff area . . . McKenzie County became North Dakota's second oil-producing county with the discovery of oil in Amerada's 1 Risser.

This successful wildcat, shown as a drilling well on the inset map, was testing after swabbing and flowing 88 bbl. of oil and 22 bbl. of water in 19 hours. Production was from the Madison.

Amerada was rigging up for an extension test just north of this discovery. Another wildcat was staked in McKenzie County by Amerada, this one in the Charlson area.

Tioga area . . . Amerada was preparing to run casing in its important Tioga extension well, the 1 L. O. Bakken. The discovery well, the 1 Harry Bakken, recently was brought in for 25 bbl. an hour.

One township north of Tioga production Amerada has another wildcat drilling below 6,700 ft., its 1 N. Skaar (Fig. 1 on inset map). New locations have been staked in this area by Amerada and by Tioga Petroleum American Viking et al.

South Dakota . . . Shell Oil Co. is drilling at 4,695 ft. at 1 Veal, wildcat in Perkins County.

WEST COAST

Harbor Drilling Eyed

LOS ANGELES.—The Los Angeles Harbor Commission, which for more than the past decade has not permitted drilling on city harbor lands, may be preparing to do an about-face and attempt to develop offshore oil reserves as is being done so successfully by the Long Beach Harbor Department.

The Los Angeles harbor board has engaged W. H. Geis, local consulting geologist, on a 3-month contract to make a survey of the harbor district's potential oil reserves. If the studies show good prospects the board may invite bids for drilling and development.

Little drilling has been done on the west end of Terminal Island and in the vicinity of the entrance to Los Angeles Harbor. What may be the best prospect, however, lies inside the Navy breakwater in the outer harbor. An aerial magnetometer survey made about a year ago revealed the presence of an untested structure which extended over a large area.

Storage Project Adopted

LONG BEACH. — After some 3 months of discussion, Long Beach Oil Development Co. has agreed to proceed with a gas-injection and storage project proposed by the Long Beach Harbor Commission for city properties in the harbor area of the Wilmington field.

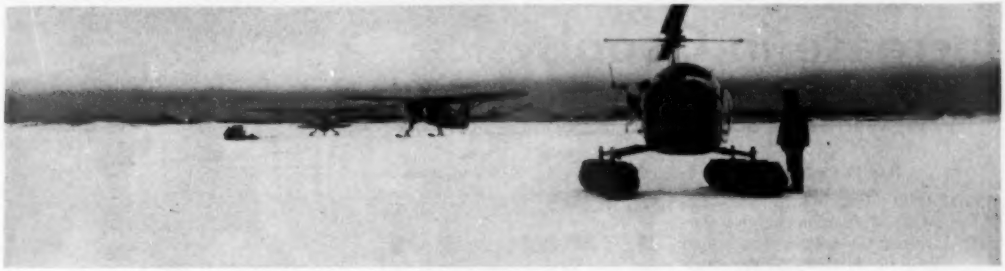
A pilot-plant study of the feasibility of injecting and storing gas will be started soon. If the experiment shows oil recoveries will be increased and the project otherwise feasible, it is planned to erect a plant capable of compressing 20,000 M.c.f. of gas daily. The pilot plant, costing about $135,000 and making use of second-hand compressors, will have a 6,000 M.c.f. capacity.

Sumatra Crude Due Soon

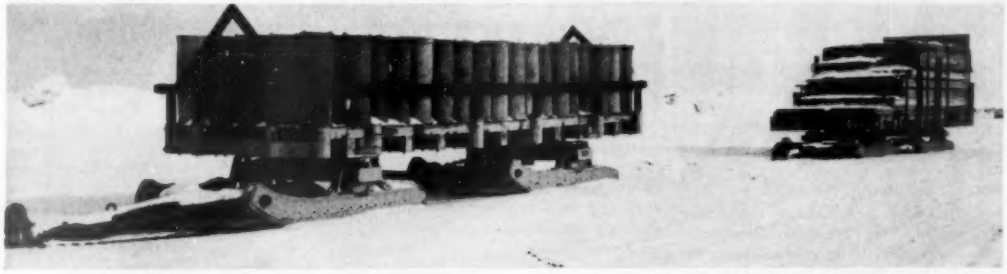
SAN FRANCISCO.—First crude-oil imports in commercial quantities from Sumatra are scheduled to arrive at the Richmond refinery of Standard Oil Co. of California about June 1.

T. S. Peterson, president, said imports are expected to build up to an average rate of 20,000 bbl. a day by August to supplement West Coast stocks and help the company meet an anticipated high summer gasoline demand.

The first shipment, now en route, totals about 200,000 bbl. of crude from Sumatra's Minas field. *(See The Oil and Gas Journal, May 12, page 103).*



FROZEN LAKE provides an airstrip for far-north operations. Helicopter in foreground is used by gravity meter party.



TECHNIQUES change to suit conditions. Front sled holds cans containing drilling chemicals. Rear sled is loaded with lumber.

New Drilling Program

Navy has five-well project under way, also is planning deep pre-Cretaceous test next year; budget not approved

A FIVE-WELL drilling program, coupled with further seismograph and field geological work is being carried out by the Department of the Navy during the current calendar year in its Petroleum Reserve 4 in northern Alaska.

Besides this work, the Navy is making preliminary plans for one deep test of pre-Cretaceous formations in 1953 and tentatively scheduling subsequent deep wells for ensuing years. This is in line with the shift in emphasis in the exploration program from Cretaceous to pre-Cretaceous structures.

For the fiscal year beginning July 1, the department is asking a total of $8,700,000 to spend in Alaska. Of this, $1,025,000 would be for surface exploration, $2,425,000 for drilling, and the remainder for supplies and transportation (*The Oil and Gas Journal, April 14, page 108*). The Navy appropriation bill for this period has not yet been passed by Congress.

Thus far, the Alaskan exploration program has cost close to $50,000,000. Information from the Navy is that the expenses of all naval reserves since 1916 has been about $75,000,000 which has been more than offset by the $92,000,000 received from production.

Current program . . . According to Capt. R. H. Meade, director, Naval Petroleum Reserves, Denver, the 1952 program calls for the following wells, all to be drilled to about 4,000 ft.: Square Lake 1, Grandstand 1, Umiat 11, Wolf Creek 3, and Weasel Creek 1. In addition, caching for a conditional well on the Grandstand anticline has been approved and accomplished.

Whether or not the well will be drilled depends on the results obtained at Grandstand 1, on which work recently commenced. As of a recent date, Square Lake 1 had been completed to the projected depth of 4,000 ft. as a dry hole.

The seismic program calls for three crews operating for about 5 months each and a full year's work for an office interpretation crew. The crews are now in the field. Three geological parties from the Navy Oil Unit, U.S. Geological Survey, will be in the field this summer. One six-man party will be in the area east of the reserve in the Canning-Shaviovik rivers region. Another six-man party will work in the Chandler River area checking surface geology with the photogeological work and will complete the mapping where surface information is available. The main objective of this party will be to map in detail some interesting structural highs found in the area.

A third geological party will be a three-man group working in the south and extreme eastern part of the Brooks Range. This party will concentrate on Paleozoic studies with particular attention being given to the Lisburne limestone of Mississippian age. The party will also attempt to study the pre-Lisburne formations, especially the Devonian rocks and the Neruokpuk formation.

Exploration work has been under way for the last 8 years in the 37,000-mile Alaskan reserve. Only reservoir of promise found so far is Umiat field, where reserves are said to range from 30,000,000 to 100,000,000 bbl. (*The Oil and Gas Journal, February 4, page 51*). The Navy's program is aimed at the present time not at development of the oil found but at obtaining a thorough and reasonable evaluation of the area's prospects.

Increase in Geophysics

Nation's seismic crews number 600, compared with 210 in 1942; West Texas activity cited at Permian basin meeting

Roy F. Carlson

MIDLAND, Tex. — Increasing geophysical exploration in the Permian basin of West Texas resulted in the drilling of 310 exploratory wells during the first 4 months of this year.

Of the 310 wells drilled, 75 were discoveries. These 75 strikes, plus 28 more in the New Mexico portion of the basin, have resulted in 36 new fields, 29 new pays, and 38 extensions.

These figures are all the more astonishing, according to H. L. Swords, exploration geophysicist with Union Oil Co. of California, because as recently as 1942 only 134 exploratory wells were drilled during the entire year.

Addressing geophysical personnel representing 130 Permian basin seismic crews and many more gravimeter crews gathered here May 17 for the first annual meeting of the Permian Basin Geophysical Society, Swords said geophysical activity nationally has increased from 210 seismic crews and 50 gravimeter crews in 1942 to about 600 seismic crews and 80 gravimeter crews today.

These are increases of 300 and 60 per cent, respectively.

Seismic velocities . . . Variations in seismic velocities in rocks within the basin warrant much further study and consideration by geophysicists, it was agreed at the meeting.

A survey of such variations indicates that seismic velocities may vary as much as 300 per cent in rocks of the same time-stratigraphic unit, according to John Daly, Midland consultant, and C. N. Page, Honolulu Oil Corp. These sharp velocity contrasts will either emphasize or mask a geological condition favorable to the accumulation of oil.

A technique described by John M. Crawford, of Continental Oil Co., provides for a quick check of elevations along a shot line by use of an altimeter.

The method was described as being accurate within 5 ft. and involves reading the altimeter in rapid succession at neighboring shot points and comparing this difference with that on the surveyors' notes.

Change in section . . . A change in seismic section between two reflecting horizons which both lie above an oil reservoir or which have the oil reservoir between them has been indicated in seismic results to date, according to E. D. Alcock, National Geophysical Co., Inc.

This anomalous change, either an increase or decrease, can be used, he said, as an exploration tool in the future.

R. B. Rice, Phillips Petroleum Co., suggested that some method of conducting preliminary surveys to determine good and bad shooting areas prior to beginning detail work in an area should be developed.

He also suggested that further investigation should be made of a method for controlling division of energy between noise and usable reflected energy and into the methods of distinguishing between such energy as shown on record traces.

Texas Cuts Output

Commission's June figure is lowest in 15 months

AUSTIN.—The Texas Railroad Commission's action in slashing the state's June crude-oil allowable to 2,847,875 bbl. daily reflects the commission's belief that surplus crude stocks should be reduced gradually to normal levels.

Even though the commission's action means the state's production will be less in June than in any month since March a year ago, the reduction was less than that asked by most oil men appearing at the hearing.

The new June allowable is 113,444 bbl. daily below the allowable in effect on May 10.

The cutback was the third ordered by the commission since the all-time record allowable of 3,159,477 bbl. daily set for April 1951. The new schedule calls for 19 producing days for the state as a whole during the 30-day month, compared with 21 days during the 31-day month of May.

While 19 producing days was allowed East Texas field, West Texas fields connected to the Phillips Petroleum Co. Goldsmith gasoline plant were cut from 20 to 19 days. Other exceptions included 14 days for Pantex field, 6 days for Pickton field, 15 for Hawkins field, and 9 for Millican field.

The new allowable by districts and that in effect on May 10 follow:

ALLOWABLE BY DISTRICTS

	June 1	May 10	Change
Dist. 1	36,664	37,330	— 666
Dist. 2	148,901	158,354	— 9,453
Dist. 3	464,269	484,774	— 20,505
Dist. 4	248,333	261,330	— 12,997
Dist. 5	57,490	60,576	— 3,086
Dist. 6*	121,006	123,576	— 2,570
Dist. 6†	276,709	268,293	+ 8,416
Dist. 7-B	106,204	110,573	— 4,369
Dist. 7-C	139,797	147,677	— 7,880
Dist. 8	945,459	998,938	— 53,479
Dist. 9	200,015	206,856	— 6,841
Dist. 10	103,028	103,042	— 14
Total	2,847,875	2,961,319	—113,444

*Outside East Texas field. †East Texas field.

Ellenburger Study Planned

AUSTIN.—A 3-year, detailed study of the Ellenburger formation and associated rocks in Texas will get under way soon.

The study, sponsored by five major oil companies, will be made by the University of Texas Bureau of Economic Geology and will be directed by Dr. V. E. Barnes, bureau research scientist.

Objectives of the project, according to Dr. John T. Lonsdale, bureau director, will be to subdivide the subsurface rocks and establish knowledge of characteristics and criteria through which the various geologic units can be identified in well cuttings and cores.

Companies sponsoring the project are Atlantic Refining Co., Gulf Oil Corp., Humble Oil & Refining Co., Shell Oil Co., and The Texas Co. Cost is estimated at $52,000.

Deep Wildcat Planned

HOBBS, N. M.—Deep zones underlying the Big Eddy Unit, the biggest unit ever approved by the New Mexico Oil Conservation Commission, soon will be tested for the first time by Richardson & Bass, Fort Worth, owners of the block.

The company last week staked a 14,500-ft. wildcat, the 1 George H. Cobb-Federal, the first of a series of at least three deep tests planned to evaluate the block's possibilities.

The block comprises 133,000 acres in southeastern Eddy County. The first wildcat is located 38 miles south of Lovington and 11 miles southwest of Buffalo Oil Co.'s 12-B Baish-Federal, recently completed Devonian discovery in Lea County's Maljamar field.

The largest unit previously approved by the commission had a total acreage of 62,000.

"I wonder what happened to me !", said Alice

ALICE in Wonderland ate the magic cake and grew until she was more than nine feet tall. Our National bureaucracy also seems to have partaken of the magic cake of power. Bureaus in our government have grown in number and scope until their activities now control, to a great extent, the lives of all individual Americans. Department after department adds more and more people -- state, justice, commerce, treasury -- not to mention those sprawling emergency born agencies of price control, N.P.A. and other alphabetical subdivisions.

The number of employees of our federal, state and local governments continues to grow. During many recent months, personnel was added to the federal payroll at the rate of 1,500 daily.

What is the reason for this mushrooming? The Korean War? Threat of war in Europe, Southeast Asia, or the Middle East? Obviously not! A glance at the federal budget gives the answer. The estimated cost of all governmental functions for the fiscal year 1952 is in excess of 70 billions of dollars, an increase of 26 billions, or approximately 60% more than last year.

When will it end? Only you, the individual citizen, who carries the bureaucratic load on his back, can stop it. It will end when enough patriotic men and women demand from congress that the Washington Wonderland start shrinking back to reasonable proportions.

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Lines Get Tax Aid

Three multimillion-dollar pipe lines are largest of 251 projects approved by DPA for fast write-off of investment

WASHINGTON. — Thirty-five projects in the oil and gas industry accounted for $223,000,000 of $488,000,000 covered by 251 certificates for accelerated amortization granted by the Defense Production Administration between April 25 and May 2.

The three largest of the 251 projects were pipe lines. They were: United States Pipe Line Co.'s $68,869,100 products line from Beaumont, Tex., to Newark, N. J.; West Coast Pipe Line Co.'s $60,035,224 crude line from Wink, Tex., to Norwalk, Calif.; and Sinclair Pipe Line Co.'s $50,245,000 crude line from Drumright, Okla., to East Chicago, Ind.

The first two were granted quick write-off on 25 per cent of the investment, while Sinclair received permission to write off rapidly 20 per cent of $27,041,520 and 15 per cent of $23,203,480.

To date DPA has granted accelerated amortization certificates at a rate exceeding $1,000,000,000 a month—$18,705,000,000 in the 18 months since the first certificates were written on October 30, 1950.

Refining projects . . . The largest refinery project carried in the latest DPA list is the $15,700,000 investment of The Texas Co. for gasoline facilities at Port Arthur, Tex., granted quick write-off on 90 per cent of $3,100,000, 65 per cent of $8,770,000, and 45 per cent of $3,830,000.

Other plant projects approved included:

California Refining Co., Perth Amboy, N. J., gasoline, 65 per cent of $572,000 and 40 per cent of $103,000; Sinclair Refining Co., Wellsville, N. Y., lubricating oils, 65 per cent of $810,000 and 45 per cent of $32,000; Petrolite Corp., six projects for desalting crude oil—at Philadelphia, $122,887; Cleveland, $75,536; Lima, Ohio, $37,218; Port Arthur, Tex., $40,728; Borger, Tex., $91,193; and West Lake, La., $40,774, all given 65 per cent.

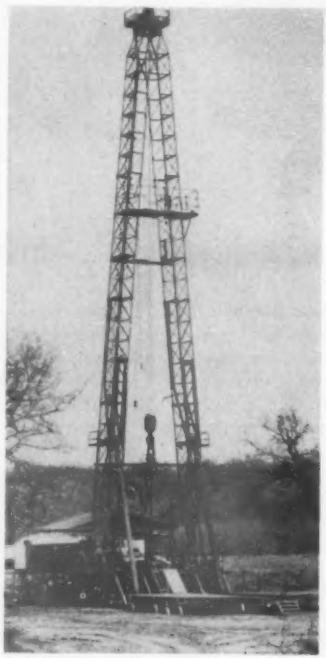
Sun Oil Co., Marcus Hook, Pa., gasoline, 90 per cent of $469,600 and 65 per cent of $1,930,400; Standard Oil Co. (Ind.), Wood River, Ill., heavy-duty motor oils, 65 per cent of $155,000, 50 per cent of $25,000, and 15 per cent of $77,000; Sinclair Refining Co., East Chicago, Ind., petroleum, 40 per cent of $237,000; Standard Oil Co. (Ind.), Wood River, Ill., products, 50 per cent of $1,940,700; Carter Oil Co., Billings, Mont., butylene-propylene polymer, 65 per cent of $845,000.

Pan-Am Southern Corp., New Orleans, gasoline, 65 per cent of $1,631,000 and 15 per cent of $25,000; Humble Oil & Refining Co., Baytown, Tex., products, 65 per cent of $50,000, and, for isobutane and propylene, 65 per cent of $298,000; Continental Oil Co., Ponca City, Okla., gasoline, 50 per cent of $922,400 and 35 per cent of $618,600; Gulf Oil Corp., Port Arthur, Tex., gasoline, 65 per cent of $143,246; Phillips Oil Co., Phillips, Tex., motor fuel, 65 per cent of $77,000 and 40 per cent of $236,000.

Petco Corp., Marrero, La., gasoline, 65 per cent of $1,770,000, 40 per cent of $140,000, and 15 per cent of $31,000; Phillips Oil Co., gasoline at Phillips, Tex., 90 per cent of $21,500, 65 per cent of $1,007,000, 40 per cent of $44,500, and 20 per cent of $393,000, and products at Sweeny, Tex., 65 per cent of $308,500; Tex Harvey Gasoline Plant, Midland County, Texas, natural gasoline, 65 per cent of $948,561, and 40 per cent of $425,785.

Transportation projects . . . Gulf Refining Co., Toledo, Ohio, 40 per cent of $274,242; Phillips Natural Gas Co., Brazoria County, Texas, 40 per cent of $400,000; Pioneer Pipe Line Co., for products line from Sinclair, Wyo., to Salt Lake City, 40 per cent of $828,000 and 25 per cent of $6,571,500.

Storage projects . . . All 40 per cent: Socony-Vacuum Oil Co., for storage at Binghamton, N. Y., $79,345, and Malvern, Pa., $392,470 (latter granted 25 per cent only); Standard Oil Co. (Cal.), Richmond, Calif., $1,960,000; Union Oil Co. of California, Rodeo, Calif., $394,000; Shell Oil Co., Seattle, Wash., $288,000—all 40 per cent.



Changes Climate

This 9,000-ft. rig, broken down into 25 trailer-truck loads, was scheduled to arrive in Canada's Leduc field last week after a 2-week overland haul from Nocona, Tex. Owned by New Continental Oil Co. of Canada, Ltd., the rig will be used in a development program calling for 50 offsets. A second rig, with a 6,500-ft. capacity, also was scheduled to be trucked from Nocona to Leduc. The first shipment weighed more than 540,000 lb.

Tidelands Decision Near

WASHINGTON. — Fate of legislation returning tidelands ownership to the states lies with the Senate, which is expected to be called upon shortly to override a presidential veto.

Passed by the House by a vote of 247 to 89 and by the Senate on a voice vote, the bill was cleared for submission to the President May 16. The President's address less than 30 hours later before the Americans for Democratic Action left little doubt that he would veto.

Among other things, he called the bill "corruption," and "robbery in broad daylight" and told the A.D.A. that it would be "just what the oil lobby wants" if we "back down on our determination to hold those rights for the people."

"Talk about corruption. Talk about stealing from the people. This would be robbery on a colossal scale," Truman said. He added that "as far as I am concerned, I intend to stand up and fight for the people's interests in this matter."

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Whether the Senate will override his veto is not known. The vote is expected to be very close.

New Studies Set

NPC investigation slated on Bunker C, oil storage

WASHINGTON.—Walter S. Hallanan, chairman of the National Petroleum Council, has set up committees to study petroleum-storage capacity and the Bunker C fuel-oil situation.

The studies earlier were requested by the Petroleum Administration for Defense and approved by the council.

The 14-man committee on petroleum-storage capacity will be headed by L. S. Wescoat, president of Pure Oil Co., Chicago, and the 24-man committee on bunker fuel oil will have as its chairman B. Brewster Jennings, president of Socony-Vacuum Oil Co., New York.

More detail sought . . . In developing up-to-date information on storage capacity, the council was asked by PAD to break the figures down in more detail than permitted under the Bureau of Mines division of the country for its statistical purposes. Particularly important in this respect, Deputy Administrator Bruce K. Brown told the council, is the subdivision of the East Coast district into three areas, to show separately the capacity available in New England, the Middle Atlantic area, and South Atlantic states. Also considered important is the subdividing of the Indiana, Illinois, Kentucky and the Pacific Coast districts.

The more detailed figures, it was pointed out, would be of value in the event of local or regional scarcity of supply of one or more products, such as has occurred in the past.

Jennings' committee will summarize the trends of domestic manufacturing, importation, and individual types of usage of Bunker C oil commencing with 1946 and continuing through 1952. In addition, assuming that the yield per barrel of crude run has diminished since 1946, it will advise as to the reasons of diminuation, including technological changes and the net effect that has resulted in per barrel yields of products.

Bunker C short . . . In requesting this information, Brown pointed out that in recent months Bunker C fuel oil has been in relatively short supply in the coastal areas, due in part to the closing down of Iranian refining and in part to the reactivation of reserve ships for international trade. At the same time relative surpluses have existed in some interior areas.

PAD's data, Brown said, indicates that the supply situation is likely to remain a problem in the coastal areas next winter and probably thereafter, a matter of interest not only to PAD but also to the Defense Department, the Defense Electric Power Administration, the shipping authorities, and the coastal industries requiring Bunker C oil.

Product Exports Down

WASHINGTON.—Exports of major oil products dropped to an average of 162,100 bbl. daily during the week ended April 25, the lowest level touched since the week ended March 14, according to figures compiled by the Petroleum Administration for Defense.

Compared with the preceding week, when a record for the year to date was recorded at 286,500 bbl. daily, sharp cuts occurred in all of the five products, distillate shipments dropping off nearly two-thirds.

Details of exports for the week ended April 25 as compared with the preceding week and averages for the 4 weeks ended April 25 are shown in the accompanying table in thousands of barrels daily.

	Week ended Apr. 25	Week ended Apr. 18	Average 4 weeks
Aviation gasoline	35.4	56.8	39.2
Motor gasoline	10.6	14.9	20.2
Kerosine	5.4	30.9	13.4
Distillate	36.2	101.6	68.2
Residual	74.5	82.3	73.1
Total	162.1	286.5	214.1

Pipe-Form Date Advanced

WASHINGTON.—Deadline for the filing of fourth-quarter PAD-26LP applications has been advanced by the National Production Authority from July 1 to June 5 in order to enable the Petroleum Administration for Defense to issue authorizations for purchase at an earlier date.

The PAD-26LP form is used by oil and gas operators in the United States and Canada to secure priorities for the purchase of line pipe for small construction and production operations and MRO when the total quarterly requirement is $5,000 or more.

Where the total quarterly line-pipe cost for these uses is less than $5,000, the operator is given the option of using Form PAD-26LP or filing his delivery orders in accordance with the M-26 order. The change in the deadline for the filing of the form will not affect the delivery-order procedure.

Brown Honored

Retiring PAD chief cited by government, oil industry

WASHINGTON.—Government officials and oil men joined May 20 in paying tribute to Bruce K. Brown for his 19 months of service as deputy petroleum administrator.

Nearly 250 attended a testimonial dinner tendered Brown by the National Petroleum Council, at which he was presented with a scroll of appreciation and a silver tray suitably engraved and bearing the names of the council members.

The presentation was made by Walter S. Hallanan, NPC chairman, who told how Brown's efforts, supported by the council and by Interior Secretary Oscar L. Chapman, showed that government-industry cooperation is possible and of benefit to the whole country.

W. Alton Jones, of Cities Service Oil Co., officiated as toastmaster. Sen. J. William Fulbright of Arkansas and Secretary Chapman spoke in warm terms of the esteem in which Brown is held in congressional and governmental circles.

The final ceremony in connection with Brown's second retirement from government service (he served as assistant deputy administrator of the Petroleum Administration for War until December 1944 and was responsible for the war-time construction of 100-octane aviation-gasoline plants) will be a PAD staff meeting May 29. Then he will be presented with the Interior Department's award for distinguished service by Chapman, and J. Ed Warren will be sworn in as his successor.

Dutch Imports Quota Filled

WASHINGTON.—The Netherlands' quota of about 22,163,280 bbl. of oil permitted to be imported into the United States this year at the 10½ cents per barrel rate under the Venezuelan trade agreement was exhausted in April.

The "catch-all" quota of all countries other than the Netherlands and Venezuela was within 262,000 bbl. of exhaustion at the end of last month, according to Customs Bureau statistics.

Venezuela still has approximately one-third of its quota left, with imports during the first 4 months amounting to about 47,570,000 bbl. of the 70,000,000-bbl. allocation.

The quota for all other countries was about 26,000,000 bbl., of which 25,700,000 bbl. had been imported up to May 3.

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WATCHING WASHINGTON

Bertram F. Linz

Pattern For Emergencies

The plan to set up industry fact-finding committees to aid in meeting product shortages occasioned by the oil strike developed too late to be of use in that emergency, but Petroleum Administration for Defense officials are hopeful it set a pattern for coping with any similar emergencies which may develop in the future.

They have in mind, specifically, the likelihood of another heating-oil crisis on the East Coast next winter. This is viewed in some quarters as practically inevitable, even though the Office of Price Administration eventually may establish higher ceilings.

If that situation develops, PAD will have to come up with another scheme for averting hardships on consumers. In view of the fact that the industry warned some months ago that the shortage it was then seeking to alleviate would undoubtedly recur next winter, it is doubtful that the companies will be willing again to take several million dollars in losses because of the procrastination and shortcomings of a government agency (OPS), which should and could avert the necessity for creating what in effect was little more than a charitable organization.

Strippers Written Off?

The entire Penn-Grade crude industry and thousands of stripper-well operators in other parts of the country apparently have been written off as worthless assets by the Office of Price Stabilization.

In the opinion of some OPS officials, at least, materials provided by the Petroleum Administration for Defense for the operation of "marginal" fields have been wasted.

All this was evidenced earlier this month by Sydney B. Smith of the office of the special assistant to the director of OPS in a letter to Sen. Lyndon B. Johnson of Texas, who had inquired about the situation of a producer constituent who was anxious to get an increase in his price ceiling.

Starting off with a statement that no case has been made for a general increase in crude-oil prices, Smith told the senator that provisions have been made for relief where necessary to correct inequities or unusual hardships in individual cases and suggested the operator make application for price relief if he feels "there are special circumstances involved in his case."

"It should be pointed out, however," Smith added, "that in view of the present supply situation it is not the policy to grant price relief in order to permit the exploitation of oil fields which are marginal in the present market. To the extent that a price increase might permit the marginal producer to operate, a wasteful consumption of critical supplies and materials might result. Moreover, it is doubtful that individual price relief would be effective in the present competitive market."

Even the wartime OPA never went so far as to legislate the marginal producer out of business. On the contrary, finally recognizing that even the smallest wells made a contribution to the total oil supply, it wound up by providing a subsidy to keep them in operation.

The important thing is that a government agency appears to be setting itself up to decide when a business is too small to be permitted to operate—something contrary to the American tradition that a fellow with an idea, a little money, and a lot of courage is free to go into business for himself, which is how many an oilman got a start.

Scrap Drive Pays Off

The heat is off the scrap situation, and, while the drive for its collection will continue, the pressure is being eased. For the next several months, at least, the steel mills will be able to operate on the scrap generated through normal channels.

The scrap situation now is far better than at any time since the Government initiated its salvage operations in April 1951, but a threat of another shortage next winter still hangs over the steel industry.

Government officials would like to see a continuance of the drive, in which the oil industry took a prominent part, with a view to developing a stockpile of scrap. However, they admit this can't be done unless the scrap collected finds an immediate market.

Rental Waiver Bill Passed

WASHINGTON. — Legislation repealing the waiver of second and third-year rentals on oil and gas leases on federal lands on which no discoveries have been made has been passed by the House of Representatives and sent to the Senate.

The bill was passed on representations by the Interior committee that present laws encourage speculation. The waiver was adopted early in the last war in the hope of stimulating discovery and production, it was explained by Rep. Ken Regan of Texas, author of the bill, but the result was "that it operated to the benefit of just a very few individuals who were speculating on federal leases."

Under the present system, Regan said, the Government is losing $7,500,000 a year in waived rentals.

During the discussion of the bill it was emphasized that it will not affect leases now outstanding but that the requirement for full payment of all rentals will be incorporated in all leases issued after enactment of the legislation.

NPA Orders Issued

WASHINGTON.—The following orders have been issued by the National Production Authority:

Amendment to M-25, May 14: Relaxing restrictions on the use of tin cans, increasing the quota for cans for motor oils from 90 to 100 per cent of base-period use, and permitting unrestricted use of gallon cans for anti-freeze.

Revocation of M-19, M-38, M-39, M-48, and M-76, and revision of M-9, May 15: Eliminating controls on cadmium, use of lead, antimony, bismuth, and distribution of lead, and removing allocation and use controls on zinc.

Revision of NPA Reg. 1, May 16: Removing inventory controls on antimony, bismuth, lead, and cadmium and liberalizing inventory limitations on zinc.

Amendment to Sched. 10, M-45, May 16: Revising the definition of "Thiokol" as any polymer produced by the chemical reaction between dichlorodiethylformal and an alkali polysulfide which is distributed as (a) a liquid polymer, (b) water dispersed latex, and (c) dry crude rubber.

Dir. 3 to M-46, May 19: Advancing the date for filing of applications for fourth-quarter requirements of line pipe for small construction and production operations and MRO in the oil and gas industry from July 1 to June 5.

New Production Mark

Kuwait and the United States spark non-Communist gain in crude output to all-time record of 11,247,100 bbl. daily

Dahl M. Duff

CRUDE-OIL production throughout the non-Communist world hit a new all-time high in March with an increase of nearly 190,000 bbl. daily over February.

Contributing most to the increase was Kuwait, where output rose approximately 140,000 bbl. daily to a new record of 784,000 bbl. daily. A year earlier—before the shutdown in Iran which has been largely responsible for the all-out production effort in Kuwait—the sheikdom's output was 375,000 bbl. daily.

Production in the United States in March gained 47,600 bbl. daily to average 6,415,000 bbl. daily during the month. This was a new high for domestic output. The previous record set last October was 6,374,500 bbl. daily.

Could have been higher... Other increases in crude production were reported in Canada, Iraq, and West Germany. The over-all world increase would have been even greater had it not been for declines in production in several countries, including Saudi Arabia, Venezuela, and Mexico.

TREND OVER THE LAST YEAR

	Western Hemisphere less U. S.	Middle East	Total foreign less Russia and E. Europe
April	2,261.5	2,013.4	4,632.1
May	2,314.0	2,203.8	4,878.4
June	2,335.5	2,172.4	4,877.8
July	2,374.5	1,835.5	4,579.0
August	2,388.0	1,789.7	4,555.3
September	2,396.3	1,741.7	4,517.6
October	2,395.6	1,810.6	4,585.6
November	2,383.7	1,940.4	4,709.5
December	2,404.9	1,846.3	4,633.1
January	2,432.3	1,832.8	4,653.5
February	2,438.8	1,860.1	4,692.0
March	2,438.8	1,999.0	4,832.1

Non-Communist production totaled 11,247,100 bbl. daily—a gain of 1.7 per cent over February. As compared to March 1951, production was up 5.7 per cent. When the estimated output of Russia and its satellites is included, total world production averaged 12,-

WORLD CRUDE-OIL PRODUCTION
(In thousands of barrels daily)

Country—	March 1952	February 1952	March 1951
Western Hemisphere:			
Argentina	68.0	68.0	70.2
Bolivia	1.5	1.5	1.4
Brazil	2.0	1.9	1.3
Canada	114.4	100.8	79.5
Chile	2.2	2.2	1.6
Colombia	104.4	103.8	107.6
Cuba	0.1	0.1	0.3
Ecuador	7.8	7.7	7.0
Mexico	215.1	221.4	207.2
Peru	46.0	45.5	43.5
Trinidad	57.4	57.5	55.5
Venezuela	1,819.9	1,828.4	1,678.4
Total	2,438.8	2,438.8	2,254.5
Europe and Africa:			
France	6.7	6.5	5.0
French Morocco	2.1	2.1	1.3
W. Germany	31.8	30.7	24.0
Italy	0.9	0.8	0.1
Netherlands	14.1	13.8	14.7
Egypt	45.1	45.8	40.3
United Kingdom	1.1	1.1	0.9
Total	101.8	100.8	86.3
Middle East:			
Bahrein	29.2	31.0	30.0
Iran	30.0	30.0	700.1
Iraq	266.0	225.8	169.8
Kuwait	784.0	643.8	375.4
Qatar	68.1	64.3	46.5
Saudi Arabia	821.4	854.9	638.9
Turkey	0.3	0.3	0.4
Total	1,999.0	1,860.1	1,961.1

Country—	March 1952	February 1952	March 1951
Other Asia:			
British Borneo	107.6	107.6	102.7
Burma	2.2	2.2	2.0
China	2.2	2.2	2.2
India	5.0	5.0	5.0
Indonesia	162.0	162.0	155.0
Japan	5.7	5.5	6.0
New Guinea	4.8	4.8	4.8
Pakistan	3.0	3.0	3.8
Total	292.5	292.3	281.5
Total foreign less Russia and E. Europe	4,832.1	4,692.0	4,583.4
United States	6,415.0	6,367.4	6,052.4
Total non-Communist areas	11,247.1	11,059.4	10,635.8
Estimated Russia and E. Europe:			
Austria	43.0	43.0	27.0
Romania	95.0	95.0	80.0
Russia	860.0	860.0	790.0
Other E. Europe	33.2	33.2	24.1
Total	1,031.2	1,031.2	921.1
World total	12,278.3	12,090.6	11,556.9

Figures are from reliable reports in the industry or official government sources. Data for Russia and Eastern Europe are based on competent estimates; no authentic information is available on month-to-month production in these areas. Completely current reports also are lacking for certain countries of Southeast Asia. Data for earlier months have been revised where necessary.

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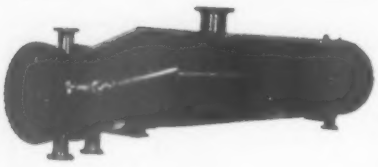

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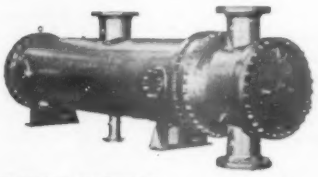

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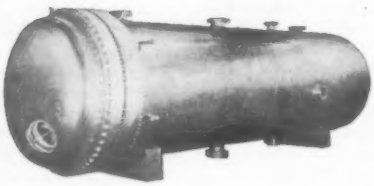
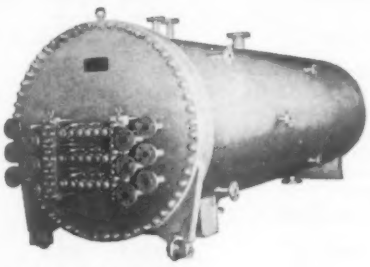


EVAPORATORS

To produce distilled water for boiler feed make-up, and for generating steam for process work



STEAM GENERATORS

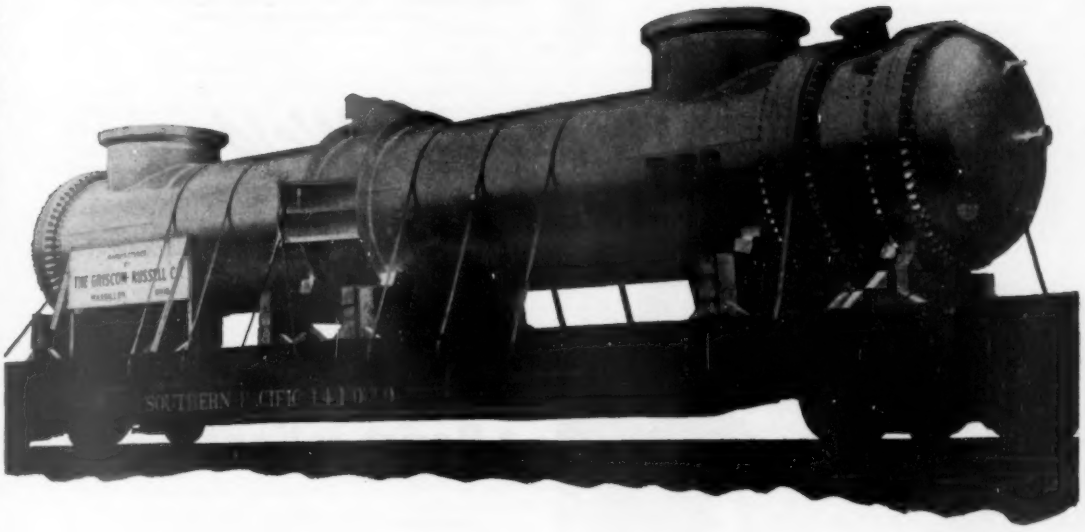
To generate steam at boiler pressure from raw, untreated water, using heat otherwise wasted in gas oil and tar streams

GR-276A

GRISCOM-RUSSELL

PIONEERS IN HEAT TRANSFER APPARATUS

Heat Exchangers



This huge unit, occupying the full length of a 53-ft flat car on its way from the Griscom-Russell plant, is one example of the G-R manufacturing facilities for heat transfer apparatus.

At the other extreme are G-R Heat Exchangers that can be readily handled by one man.

Between these two extremes are the many types of G-R Heaters, Coolers, Condensers, Evaporators and Heat Exchangers, of which Griscom-Russell has built almost 200,000 to handle all types of liquids, gases and vapors for all industries.

Each G-R design is based on the 85-year specialized experience of the oldest and largest exclusive manufacturer of heat transfer apparatus. Each type has many distinctive features that assure superior effectiveness, economy and durability.

Write for 32-page bulletin describing G-R Tubular Heat Exchangers in detail.

THE GRISCOM-RUSSELL CO., MASSILLON, OHIO

How to land strings under proper tension

Reminders of Good Casing Practices:

Definite instructions should be available for the proper string tension, also on the proper landing procedure after the cement has set, to apply this tension. The purpose is to avoid critical stresses or excessive and unsafe tensile stresses at any time during the life of the well. In arriving at the proper tension and landing procedure, consideration should be given to all factors such as well temperature and pressure, temperature developed due to cement hydration, mud temperature, changes of temperature during producing operations, and the movement of the freeze point during the life of the well.

Reprinted by permission from "API Recommended Practice RP 5 C1: Care and Use of Casing, Drill Pipe and Tubing."

REPUBLIC *Electric Weld* CASING and TUBING

- **Make up fast**
- **Resist pull out**
- **Resist collapse**

. . . because they're uniformly round, uniformly strong, uniform in wall thickness and diameters. Republic Electric Weld Casing and Tubing are cold-formed from high ductility steel, and full normalized for uniform structure. Casing is cold sized to further increase its high yield point. Uniform depth of tough steel under thread roots guards against pull-outs. Clean, full-formed threads stab, spin-in and tong-up fast . . . and tight. Write for literature.

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NORMALIZED CASING AND TUBING

REPUBLIC STEEL

Other Republic Products include Line Pipe—Carbon, Alloy and Stainless Steels—Upset Studs, Bolts and Nuts—Electrunite Heat Exchanger Tubes

278,000 bbl. daily during the month.

Canada . . . The increase in Canadian production of nearly 14,000 bbl. daily was a start on the seasonal upturn in output from Alberta's fields. The opening of shipping on the Great Lakes and increased demand during the summer months is expected to result in a record Canadian production later this year of close to 250,000 bbl. daily.

A tabulation of the main Alberta fields, released by the Conservation Board at the end of February, showed potential in the province of nearly 280,000 bbl. daily.

Latin America . . . Mexican production in March slipped back slightly.

Output in Colombia was little changed. Colombian production by concessions was: De Mares (government), 34,775 bbl. daily (not including condensate, 2,345 bbl. daily); Barco, 28,011 bbl. daily; Yondo, 36,918 bbl. daily; Dificil, 1,501 bbl. daily; and Velasquez, 3,216 bbl. daily; total crude and condensate, 106,766 bbl. daily.

The drop in production in Venezuela was the first time in 7 months that production in this country has failed to set a new record. Figures from the Ministry of Mines and Hydrocarbons showed that output of Creole Petroleum Corp. was down about 10,000 bbl. daily during the month. This was due principally to inspection work at the Caripito refinery which reduced runs from Quiriquire field in eastern Venezuela.

Some Venezuelan officials earlier had anticipated production would reach 2,000,000 bbl. daily by the end of the year, but it now seems more likely this mark will not be attained until 1953. There is very little spare producing capacity in the country. Last week at Maracaibo, Gustavo Thery Fombona, technical director of mines and hydrocarbons, indicated the industry can expect new exploitation concessions to be granted.

Figures from the ministry show the following production by operators (in barrels daily):

	March	February
Creole	810,709	820,796
Shell	573,342	564,339
Mene Grande	265,745	269,978
Socony	58,009	56,680
Mercedes	25,159	25,243
Texas	18,392	19,362
Atlantic	17,146	17,459
Richmond	16,279	19,820
Sinclair	13,539	14,108
Pantepec	8,428	8,696
Phillips	12,202	10,952
B.C.O.	958	988

Middle East . . . In the Middle East, the increase in production in Iraq was due principally to greater output from Kirkuk because of the new 30 and 32-in. pipe line to Banias, Syria. The first crude was not lifted from the Banias terminal until April 11, but production was stepped up during March to meet the needs for line fill.

Of Iraq's production of 266,000 bbl. daily during March, 212,000 bbl. daily came from Kirkuk.

Nearly 46,000 bbl. daily was produced from Zubair field in southern Iraq which began commercial operation only last December. Work is now starting on a new large-diameter line paralleling the existing line from Zubair to the Fao terminal on the Shatt-el-Arab River.

Production in the Persian Gulf sheikdom of Qatar rose to a new record of about 68,000 bbl. daily during March. Iraq Petroleum Co., Ltd., the operator, is reported to be planning a second line across the peninsula to the tanker terminal.

The 30,000 bbl. daily production in Iran was estimated on the basis of available reports from this country. The National Iranian Oil Co. is understood to be running one unit at the Abadan refinery on a limited basis, presumably to replace withdrawals made from the refinery storage for domestic needs in the country.

There has been no export from the nationalized industry, and Anglo-Iranian Oil Co., Ltd., has said it will take legal steps against anyone lifting oil from its properties which the Iranian Government organization now controls.

Yugoslavia . . . A recent report from Belgrade said Yugoslavia produced about 3,000 bbl. daily in 1951 and that the amount was sufficient to cover one-third of the domestic requirements.

Although Yugoslavia is hampered by shortages of tubular goods, the government is expecting to raise output by about 1,000 bbl. daily during 1952.

Several American engineers are expected in Yugoslavia to assist its oil industry under United Nations sponsorship, and the country is seeking to send some of its own technical personnel abroad to study oil operations under U.N. fellowships.

EUROPE

Refining Gains

West German plants may meet local demand soon

THE continued expansion of the refining industry in West Germany is shown in the recent report of the republic's Mineral Oil Industry Association in Hamburg.

Last year, 4,700,000 tons (about 94,000 bbl. daily) of the 5,320,000 tons of products marketed in inland West Germany were produced domestically. In 1950, domestic production met 3,330,000 tons of the 4,210,000-ton consumption.

The two most important products were gasoline, sales of which rose from 1,330,000 tons in 1950 to 1,500,000 tons last year, and diesel oil, up from 1,300,000 tons to 1,510,000 tons in 1951. The percentage of the market supplied by imported products dropped from 20.9 per cent in 1950 to 11.6 per cent in 1951.

Refinery capacity at the end of the year was 6,100,000 tons (about 122,000 bbl. daily). Three new refineries came in operation in West Germany last year. They were Ruhrchemie, A.G., of Oberhausen-Holton, capacity 250,000 tons; Ruhrbau, GmbH., Muehlheim, 200,000 tons; and Kraftstoff - Handelsgesellschaft, mbH. of Essen, 35,000 tons.

As in most other countries throughout the world, the petroleum industry in Germany is concerned about the increasing amount of taxes levied on use of its products. The association pointed out that the tax on motor fuel has become so high that it curbs consumption. Last year, tax collections on oil products in West Germany rose nearly sevenfold to a total of 454,600,000 marks.

Look to exports . . . With indications that the rising refinery capacity may be overtaking the rate of growth of demand, West German refiners are looking toward the possibility of export sales.

Exports of petroleum from West Germany are still far below prewar levels, and it is hoped that the more favorable tax treatment now granted the industry will lead to improved foreign sales.

An indication of the more recent trend in West German refining was given in figures showing that total throughput during the first quarter of 1952 was 1,240,000 tons, which is at a rate of almost 5,000,000 tons annually or about 100,000 bbl. daily.

During the first quarter, production comprised 375,656 tons of gasoline, 329,392 tons of diesel, and 9,020 tons of benzol. Crude supplies were 374,233 tons domestic production and 843,295 tons imported.

O.E.E.C. estimates . . . The Organization for European Cooperation in its second report last year estimated West German refinery throughput in 1952-53

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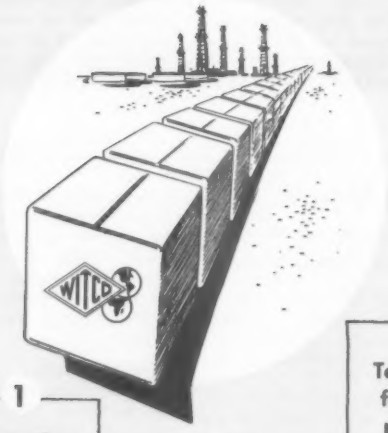

Witco Gelling Agents have been formulated for a wide variety of applications, particularly the following five . . .

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Witco also manufactures external gel breakers for all applications. In low concentrations, these gel breakers are recommended as viscosity stabilizing agents.

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would reach 6,340,000 tons. Of this throughput, production of motor gasoline would be about 2,100,000 tons.

Because of the coal production, German oil consumption runs heavily to the lighter fractions, and German refinery plans thus involve considerable cracking and use of hydrogenation facilities for processing petroleum residues and distillates.

A report issued recently in Hamburg by the Esso A.G., Standard Oil Co. (N. J.) West Germany affiliate, emphasizes the shift to domestic refining. The company pointed out that in 1938, 77 per cent of all imports consisted of finished products but that last year, products accounted for but 10 per cent of Esso's purchases abroad.

Esso's refinery facilities have been expanded to 700,000 tons annually (about 14,000 bbl. daily), and its plans call for further expansion to 1,400,000 tons annually by 1954.

AFRICA

New Concession

Sinclair obtains rights in former Italian Somaliland

THE Sinclair organization has been granted a concession over a part of the former Italian Somaliland which adjoins the Ogaden area in Ethiopia where Sinclair is now drilling.

The grant was announced in Rome by the Italian Trusteeship Administration which administers the territory under authority from the United Nations. The announcement said the agreement provides for a large investment by Sinclair in the area, but details were not immediately available in New York.

The prospecting rights were made to a company identified as Sinclair Somal Corp. They were negotiated by L. V. Stanford, a Sinclair director who has been in charge of the Ethiopian operation. The area involved is in the eastern part of the former Italian colony and offsets the Ethiopian section now being tested.

Reports from Rome indicated the trusteeship administration also is considering granting rights in the territory to the Italian government company, Azienda Generale Italiana Petroli.

The U.N. General Assembly in November 1949 approved creation of a new African sovereign state, Somalia, out of Italian Somaliland and provided for its administration by the Italian-U.N. trusteeship until 1960, which was the tentative date set for its complete independence. The territory's total area is 194,000 sq. miles, and its only port is at the capital, Mogadisho.

The Ogaden area of Ethiopia is in the eastern part of the kingdom. Earlier this year Sinclair started its second well there at a location near the village of Galadi (*The Oil and Gas Journal, March 31, page 73*). The test is now drilling below 1,500 ft.

MIDDLE EAST

Water Plants Release Ships

Construction of large water distillation plants in the arid shaikhdom of Kuwait has released three 850-ton tankers to the coastal oil trade in the United Kingdom.

The vessels, the Adib, the Amin, and the Amir, formerly were used to carry fresh water from the Shatt-al-Arab River. The condensation plants have reduced the need for fresh water to the point where the three vessels were no longer required in the Persian Gulf.

Anglo-Iranian Oil Co., Ltd., said the tankers have joined the Shell-Mex and B. P. coastal fleet and that they will be renamed shortly. The vessels were brought to England on the 6,200-mile voyage from the Persian Gulf each carrying a cargo of kerosine from the Bahrein refinery.

In Kuwait, Kuwait Oil Co., Ltd., has built a 500,000-gal.-daily water plant, and the government of the shaikhdom, using some of its oil revenue, has a 1,000,000-gal.-daily plant under construction and due for completion next year. The only indigenous water supply in Kuwait is brackish water drawn from wells.

International Briefs

Standard-Vacuum Oil Co. is making preparations to carry out preliminary exploration work on the French island of Madagascar off the southeast coast of Africa. Some exploration personnel have been sent from the United States for the operation. French interests have been doing oil exploration in parts of Madagascar for several years.

Drilling equipment is expected to arrive in western Australia about the end of July for the Caltex-Ampol exploration program in Northwest Cape. Geophysical work is being carried out in the meantime, and the first well probably will be spudded in about the end of August. The Caltex interests in the program are represented by the new American Overseas Petroleum, Ltd., Eastern Hemisphere exploration affiliate of The Texas Co. and Standard Oil Co. of California.

LATIN AMERICA

Outlet Completed

Pemex to begin movement of oil from Rabon Grande

PETROLEOS MEXICANOS has completed the short 4-in. welded pipe line which will move the production of Rabon Grande field in southern Mexico to Minatitlan, Veracruz.

Rabon Grande, developed by Mexican American Independent Oil Co. under its percentage-of-production contract with Pemex, now has been built up to produce in excess of 7,000 bbl. daily, and further increases are anticipated with the completion of additional wells.

The capacity of the new line is estimated at about 11,000 bbl. daily. In the field, Rabon Grande 16 was recently completed as an "A" sand producer with an initial production of about 470 bbl. daily of 32.8°-gravity oil. No. 15 was recently completed as an "A" sand producer showing an initial production of 250 bbl. daily of 33°-gravity crude, and No. 26 has been spudded in a short distance southwest of No. 14.

Outstanding discovery . . . Rabon Grande is ranked as one of the outstanding Mexican oil discoveries of last year. In February, Sen. Antonio J. Bermudez, Pemex director-general, said reserves had been estimated at more than 50 million barrels by CIMA. The discovery well drilled by CIMA was brought in June 13, 1951, at a depth of 2,474 ft. in the "B" sand (Miocene) with an initial production of 195 bbl. daily. The structure is a salt dome. Some of the wells have had considerable difficulty with sanding.

CIMA, continuing operations under its contract, has been preparing to spud in a deep wildcat on the Macultepec structure. The company also has a second location to be drilled soon near Minatitlan. CIMA is owned by American Independent Oil Co., the Belgian company Petrofina, and Edwin W. Pauley.

Recent reports from Mexico City are that Kerr-McGee Oil Industries, Oklahoma City, which has been the drilling contractor for CIMA through a Mexican subsidiary, has sold all its rigs and equipment to CIMA. Besides taking over the Kerr-McGee equipment, CIMA also is buying a new National 50 rig from the factory.

PERSONALS

Production Head

Barbour began oil career with cable-tool contractor

MORE than 30 years in drilling and production work is the background of Russell C. Barbour, manager of Humble Oil & Refining Co.'s production department.

Barbour began his career when cable rigs were used extensively and rotary drilling equipment was in its early stages of development. After working for several cable tool drilling contractors he joined Sun Oil Co. He held various jobs in crude oil operations for Sun and was promoted to field foreman.

He joined Humble in 1921 as a lease pumper. In 1923 he was appointed district superintendent of Powell oil field and in 1931 he became assistant superintendent of the East Texas district. Three years later he was sent to West Texas as division superintendent. He became East Texas division superintendent in 1936 and served in that position for 10 years.

Barbour rose to general superintendent of the production department at Houston in 1946 and finally to production manager in 1951.

As part of the company's executive training program he has attended the advanced management program at Harvard University, Boston.

T. H. Acres, Sunray Oil Corp., Los Angeles, has been elected chairman of the Pacific Coast district of the American Petroleum Institute's Division of Production. He succeeds **Paul M. Andrews,** Signal Oil & Gas Co., Los Angeles. Other district officers include: **J. T. Crooker,** Standard Oil Co. of California, Taft, vice chairman of the San Joaquin area; **Stafford Park,** Fullerton Oil Co., Pasadena, vice chairman, Los Angeles Basin area; **J. P. McCabe,** Tide Water Associated Oil Co., Ventura, vice chairman, coastal area; **John H. Van Deventer,** Cerutti-Thompson Co., Avenal, vice chairman, Coalinga-Kettleman area; **C. T. Reichert,** National Supply Co., Torrance, reelected treasurer, and **Mrs. Elsie Edmiston,** American Petroleum Institute, Los Angeles, reelected secretary.

Dr. Victor H. Kulp, 70, professor of oil and gas law at the University of Oklahoma, Norman, will retire this year after 41 years of teaching. His books include "Casebook on Oil and Gas Law," "Digest of Oil and Gas Decisions," and "Casebook of Western Mining Law."

R. O. Mitchell has been appointed assistant division geologist for the Canadian division of Stanolind Oil & Gas Co. He joined Stanolind in Kansas in 1941.

Vernon W. Ebeline, formerly plant engineer for Natural Gas Pipeline Co. of America at Glasco, Kans., has been appointed construction engineer for Texas Illinois Natural Gas Pipeline Co. at Texarkana, Tex.

William M. Capps, engineer for Amerada Petroleum Corp., has been transferred from Tulsa to Big Lake, Tex.

Floyd C. Lantz, formerly assistant to the vice president of Imperial Oil, Ltd., in charge of supply and transportation, has been named head of the company's new pipe-line department. Other recent changes include: **R. A. Parkinson,** who formerly served as assistant right-of-way supervisor in the Sarnia products pipe-line division, appointed general assistant of the pipe-line department; **Bruce H. MacKenzie,** formerly coordinator for the Sarnia refinery expansion and modernization program, appointed chief engineer for the pipe-line department; **T. A. Haslett,** formerly assistant pipe-line adviser, appointed assistant chief engineer of the pipe-line department; **Capt. J. T. Stuart,** appointed manager of the Sarnia products pipe-line division; **J. H. Hamlin,** formerly division solicitor, appointed management assistant of the western producing division.

John C. Gerdsen, chief drilling engineer for Union Sulphur & Oil Corp., has been transferred from Sulphur, La., to Houston.

C. H. Wright, president of Sunray Oil Corp., has been elected chairman of the board and chief executive officer. **F. B. Parriott,** retiring board chairman, has been named chairman of the executive committee. **W. C. Whaley,** former vice president, has been elected president. Whaley recently was transferred to Tulsa from Los Angeles, where he served as manager of the company's California division. **F. L. Martin**

C. H. WRIGHT

W. C. WHALEY

has resigned as a director and vice president in charge of the company's refining and pipe-lines division to become president of Suntide Refining Co., a new company organized by Sunray and outside banking interests to construct and operate a 25,000-bbl. refinery near Corpus Christi. Other new officers elected by Sunray's board of directors include **Edward Howell,** vice president and general counsel; **Paul E. Taliaferro,** vice president and assistant to the president; **H. O. Harder, H. W. Manley, R. E. Foss, M. Darwin Kirk,** and **W. L. Horner,** vice presidents; **W. D. Forster,** secretary, and **L. W. Bennett,** treasurer. Bennett was elected a director of the corporation to fill the vacancy caused by Martin's resignation. Horner, who has been manager of the company's reservoir - engineering department, has been named vice president in charge of this activity. Manley will be in charge of the manufacturing, pipe-line, and sales departments. In other appointments **L. G. Rodgers** was named head of a new technical - service section; **R. L. Johnson** was named general manager of Oklahoma refineries; **R. W. Griffith** was named manager of gas - gasoline plants; and **J. R. (Dick) Ellis** was named manager of pipe lines and terminals.

Fred L. Smith, Jr., geologist, is in charge of the newly opened Houston offices of Natural Gas & Oil Corp., Shreveport. Smith formerly was associated with Atlantic Refining Co., Frio

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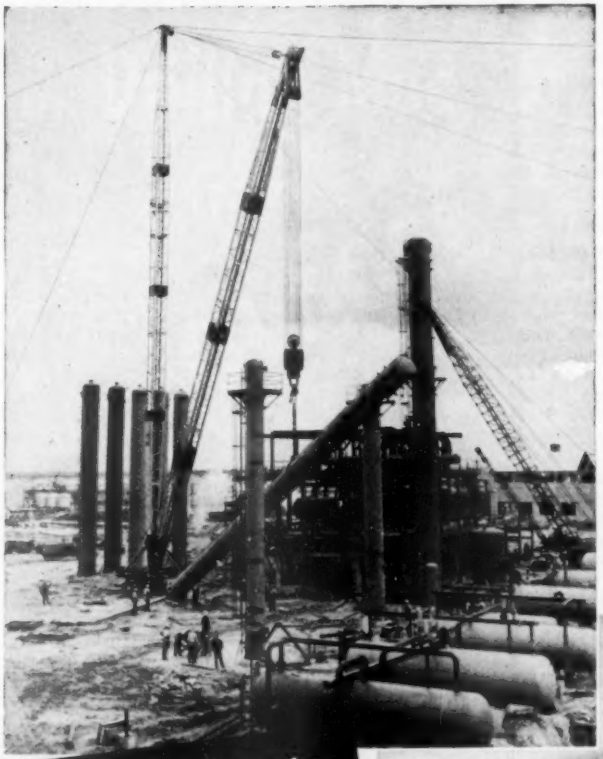

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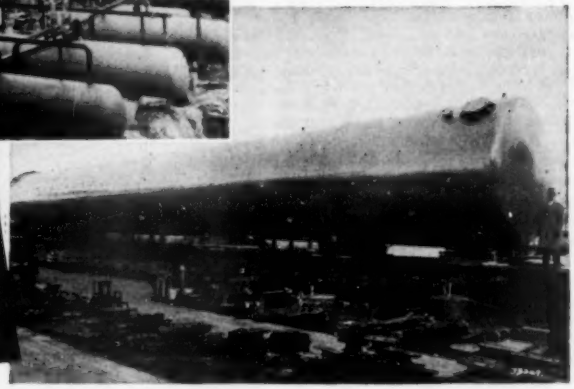

Dimensions of a number of units in this plant were limited only by railroad clearance from fabricating point to job site. The Primary Still, weighing 312,000 lbs. is the heaviest vessel installed in a natural gas processing plant, as far as we know. Most of the special fabricated equipment in the project was made in our Denver shops.

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PERSONALS

Petroleum Co., and Chicago Corp. Natural Gas & Oil was formed in 1950 and has production in Hardin County, Texas, and Calcasieu Parish, Louisiana.

Fred Fues, vice president of Chicago Corp., is moving from Corpus Christi to Fort Worth in line with transfer of the company's executive headquarters.

Graham S. Campbell has resigned from Phillips Petroleum Co. to do geological consulting work at Salt Lake City. He is president of the Intermountain Association of Petroleum Geologists and has worked for Phillips in the Rocky Mountain area.

Roy E. Wingo has been appointed general superintendent for Oklahoma for Mid-Continent Petroleum Corp. He joined the company as a roustabout in 1920 and became a superintendent in 1943.

John J. Oliphant, production superintendent in the San Joaquin division for General Petroleum Corp. since 1948, has been promoted to division superintendent. He will be succeeded as production superintendent by **J. F. Bohns.**

Robert A. Kidd, intermediate petroleum engineer for Sinclair Oil & Gas Co., has been transferred from Drumright, Okla., to Oklahoma City. Other changes recently announced by the company include: **Charles W. Shawn,** roustabout at Ardmore, Okla., named assistant district foreman at Sedan, Kans.; **Robert W. Stallings,** assistant district foreman, transferred from Odessa, Tex., to Velma, Okla.; **Robert W. Hard,** assistant district foreman, transferred from Russell, Kans., to Odessa, Tex.; **Levi H. Straily,** assistant district foreman, transferred from Sedan to Plainville, Kans.; **Ollie W. White, Jr.,** promoted from junior petroleum engineer to intermediate petroleum engineer at Delaware, Okla.; **E. J. Lisius,** roustabout at Kiefer, named assistant district foreman at Ardmore, Okla.; **Charles M. Rieder,** junior petroleum engineer at Arp, Tex., appointed intermediate petroleum engineer at Columbus, Tex.; **Daniel Tabachnick,** promoted from roustabout to junior petroleum engineer at Delaware, Okla.; **Clayton Walker,** junior petroleum engineer, transferred from Kiefer, Okla., to Tulsa; and **Charles B. Ammann,** roustabout at Kiefer, named junior petroleum engineer at Drumright, Okla.

R. P. Autrey, chief engineer for United Gas Pipeline Co. at Shamrock, Tex., has been transferred to Refugio, Tex.

Clyde Byrd, chief engineer for Sinclair Oil & Gas Co., has been transferred from Taft to Longview, Tex.

Paul B. Fahle has resigned as district geologist for Plymouth Oil Co. in Shreveport to become a consultant.

T. S. Mitchel, formerly division mechanical engineer for Shell Oil Co. at Long Beach, has been transferred to Casper, Wyo. Other company changes: **Dave F. Toomey,** mechanical engineer, transferred from Long Beach to Billings, Mont.; **J. L. Bowen,** exploitation engineer, transferred from Los Angeles to New York; **P. H. Wright,** promoted from production foreman to mechanical engineer and transferred from Brea, Calif., to Glendive, Mont.; **A. H. Curry,** promoted from production foreman to district production foreman at Ventura, Calif.; **S. S. Day,** geologist, transferred from Phoenix, Ariz., to Ventura, Calif.; **R. L. Rose,** geologist, transferred from Bakersfield to Long Beach; **G. R. Harris,** seismologist, transferred from Casper, Wyo., to Billings, Mont.; and **R. H. Rudeen,** junior geologist, transferred from Sacramento to Seattle.

Award Winner

Chester F. Smith, right, vice president and director of Standard Oil Co. (N. J.), as he received one of two certificates of appreciation awarded at the annual meeting of the American Petroleum Institute's Division of Refining in San Francisco. Presenting the certificate is David E. Day, vice president of Richfield Oil Corp. and secretary of the general committee of the refining division. The other award was received by Clarence L. Thayer, vice president of Sun Oil Co., on behalf of J. Howard Pew, director and former president of Sun, who was not present.

Robert Fearon, inventor of radioactivity logging methods and a founder of Well Surveys, Inc., has opened an engineering consulting office in Tulsa. Fearon, who formerly was manager of the W.S.I. research department, will specialize in electrical and nuclear instruments, well-logging methods, and safety engineering.

Bowman Thomas, assistant manager of the production department of Humble Oil & Refining Co., will spend a year on loan in the offices of Standard Oil Co. (N. J.). Other 1-year training assignments announced by Humble as part of an executive development program, include: **J. H. Galloway,** assistant superintendent of the West Texas division, to become assistant manager of the production department in charge of unitization and proration problems; **J. S. Boldrick,** assistant Louisiana division superintendent, to become assistant manager of the production department in charge of engineering and technical services, and **R. J. Schilthuis,** assistant superintendent of the gas division, to be assistant manager of the production department in charge of operations. **R. R. McCarty,** who has completed a 1-year training assignment as assistant manager of the production department in charge of operations, will return to his regular position as assistant superintendent of the Southwest Texas division. During the first 6 months of Galloway's training assignment **N. N. Jones,** superintendent of the Means district, will become assistant superintendent of the West Texas division. **Ed E. Byrd,** assistant superintendent of the Winters district, will become district superintendent of the Means district for a 6-month period. During Boldrick's training assignment, **Douglas Ragland,** chief petroleum engineer, will become assistant superintendent of the Louisiana division; **T. J. Fuson,** engineer in charge of the petroleum engineering division, will become chief petroleum engineer; **J. C. Posgate,** petroleum engineer for the Louisiana division, will become engineer in charge of the petroleum engineering division, and **W. T. Ilfrey,**

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WEIGHT MATERIAL

BAROID—The first and still the finest drilling mud weighting material.

CHEMICAL TREATING AGENTS

TANNEX—An improved quebracho compound, which will not cake or deteriorate in storage.

CARBONOX—An organic mud thinner and the emulsifying agent in oil emulsion muds.

TANNEX RED MUD CONDITIONER NO. 11—A liquid alkaline-tannate mixture for use where tannin-caustic conditioners are needed.

BARAFOS—An extremely high quality polyphosphate.

ANHYDROX—Prevents or overcomes anhydrite and gypsum contamination.

SMENTOX—A chemical compound for preventing or overcoming the effect of cement contamination.

SPECIAL DRILLING FLUIDS

BAROID EMULSION MUDS—Easily maintained oil-in-water emulsions which have excellent lubricating qualities, reduce torque, increase rate of penetration, have good stability under high-pressure and high-temperature, and good resistance to most common contaminants.

LOST CIRCULATION MATERIALS

FIBERTEX—The first scientifically-developed fibrous material for preventing or overcoming lost circulation.

JELFLAKE—A fragmented cellophane foil for preventing and restoring lost circulation.

MICATEX—A ground mica prepared in two grades, fine and regular, for overcoming mild cases of lost circulation. Fine Micatex will pass through the shaker screens, remaining in the system, thus being immediately available for plugging formation voids.

Complete drilling mud service
underline that word "complete"

PERSONALS

assistant petroleum engineer of the Louisiana division, will become division petroleum engineer. **W. J. Barrett,** who has been filling the position of assistant superintendent of the Southwest Texas division during the training assignment of McCarty, will return to his regular position as superintendent of the Government Wells district. During the training assignment of Schilthuis, **John J. Carter,** gas contract supervisor and analyst, will become assistant superintendent of the gas division. The 1-year assignments become effective June 1.

Dan E. Hayes is district geologist of a new district land and exploration office estabiished at Lewiston, Mont., by Sohio Petroleum Co. A graduate of the University of Oklahoma, he joined Sohio in 1949 in Oklahoma City.

Steven H. Harris has resigned as district stratigrapher for Shell Oil Co. in the Williston basin and opened offices as a consulting geologist at Bismarck, N. D.

Donald H. Fulkerson, geologist for Carter Oil Co., has been transferred from Miles City, Mont., to Fort Smith, Ark.

John Rold, geologist for The California Co., has been transferred from Dickinson, N. D., to Malta, Mont.

W. P. Lawrence, seismograph party chief for Amerada Petroleum Corp., has been transferred from San Angelo, Tex., to Artesia, N. M.

J. C. Westfall, Jr., Evansville, Ind., is now doing geological consulting work for Skiles Oil Corp. He received his degree in geology from the University of Oklahoma.

Lt. Col. Roy W. Whitson, who has been assigned to the Office of Petroleum Programs in the Munitions Board, has been ordered to overseas duty in the Far East and will leave for his new station in July or August.

C. G. Butte, Houston, has been transferred to newly reopened Ventura, Calif., plant of Shell Chemical Corp. as chief engineer. Others transferred from Houston include: **Francis T. Tymstra,** as technological department manager, and **Frank B. Ball,** as assistant department manager of operations. **J. W. Hyde** has been appointed assistant chief engineer for Shell in Houston.

B. E. Yester, production engineer for Ohio Oil Co., has been transferred from Lance Creek to McFadden, Wyo.

Al C. Proctor, geologist for Gulf Oil Corp., has been transferred from Durango, Colo., to Evansville, Ind.

John R. Fanshawe, Casper, Wyo., consulting geologist, will move his offices to Billings, Mont., June 1.

Kenneth R. Parsons has resigned as district geologist for The Texas Co. at Lewistown, Mont., to open consulting offices.

John P. Lewis, geologist for Chapman Oil Co. at Mount Pleasant, Mich., since 1948, is now with Skelly Oil Co. at Billings, Mont.

L. A. Shankle, petroleum engineer for The Texas Co., has been transferred from Chase, Kans., to Wichita.

P. F. Cochran, production engineer for Pure Oil Co., has been transferred from Chicago to Jal, N. M.

F. W. Harrison, field drilling superintendent for United Gas Co., has been transferred from the Shreveport to the Monroe district. **John C. Dezelle,** formerly district manager at Gulfport, has been transferred to Beaumont, Tex., and appointed assistant division manager.

D. A. Schmeekle, division mechanical engineer for Shell Oil Co., at Donaldsonville, La., has been transferred to the Calgary, Alta., area.

F. H. Graves, operator of Graves Drilling Co., has moved his office from Marietta to Ardmore, Okla.

William M. Brodrick, formerly division exploration manager for Anderson-Prichard Oil Corp., has joined Heathman & Co., producers and contractors, in Wichita.

Harry C. Boyd-Snee, Houston, has been transferred to Bismarck, N. D., to be in charge of a new office there for Stanolind Oil Purchasing Co. Succeeding him as head of the Houston office is **Merle S. Keffer,** who has been with Stanolind in Abilene the past year. **W. S. Maxwell,** formerly at Midland, has been transferred to Abilene to handle oil-purchasing activities in the West Central Texas district.

DEATHS

R. L. Hill, 74, widely known oil producer and lease broker, died of a heart attack while driving to Chapman, Neb., May 16. He organized several oil and gas companies, the first of which drilled the second commercial producer in Michigan at Saginaw in 1925. A son, Ralph W. Hill, is senior mechanical engineer for Stanolind Oil & Gas Co. at Tulsa.

L. E. Etchison, head of the land department of Amerada Petroleum Corp. in Tulsa, died of a heart attack May 16. He formerly was in the land department of The Texas Co. at Shreveport, La.

Fred McManis, 74, manager of W-K-M Co. of Houston, manufacturers of oil-industry valves, died recently at his home in Houston. He was one of the company's original founders in 1919.

Judson (Jack) T. Brown, 67, a veteran oil operator in California's Signal Hill area, died May 11 at his home in Long Beach.

Arthur Dale King, 79, president of Kimble Oil Co., died recently in San Francisco.

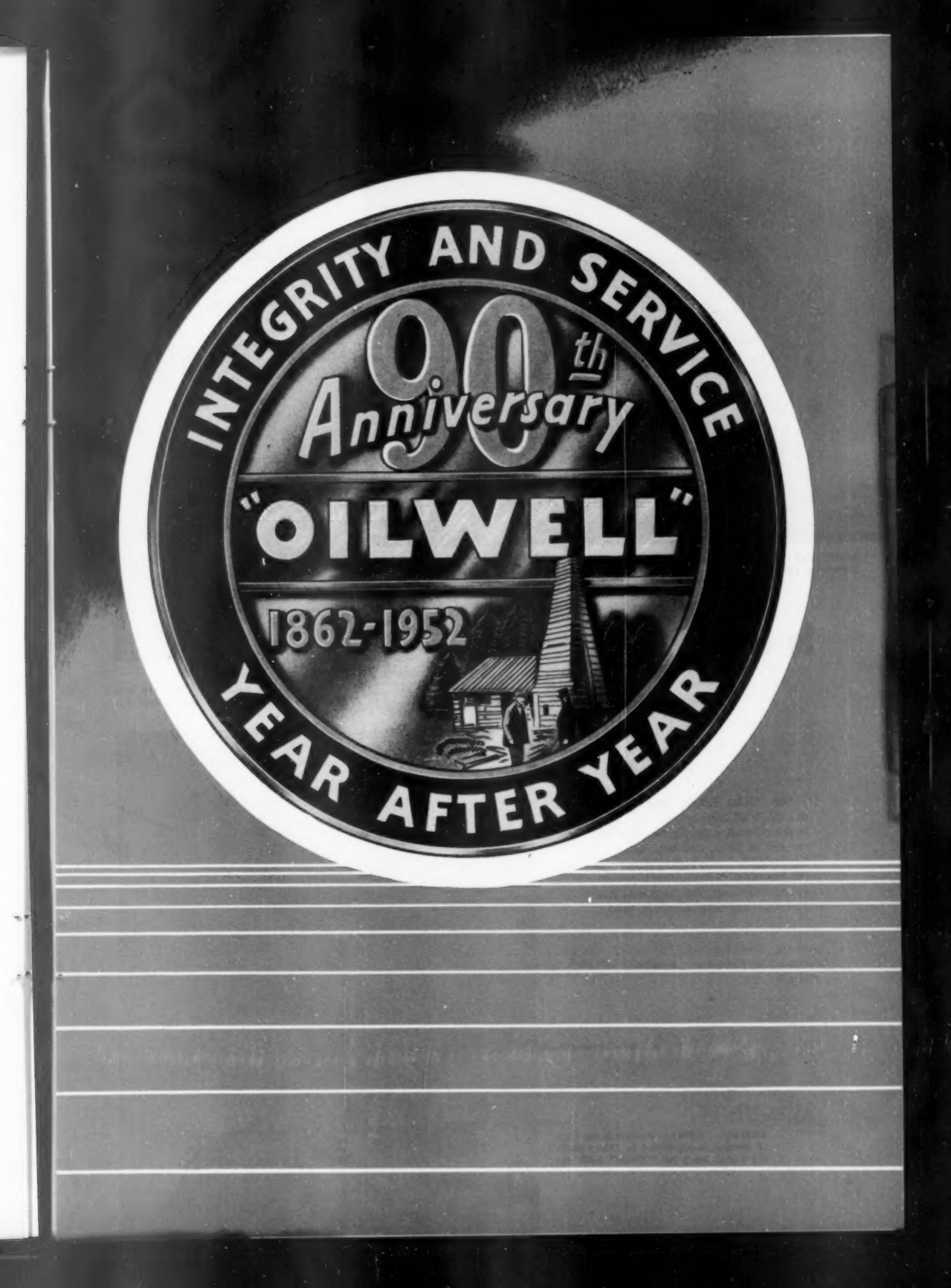
Ernest Butterworth, Jr., 43, head of the maintenance and construction department at the Esso Standard Oil Co. refinery at Baton Rouge, La., died recently in Baton Rouge following a long illness.

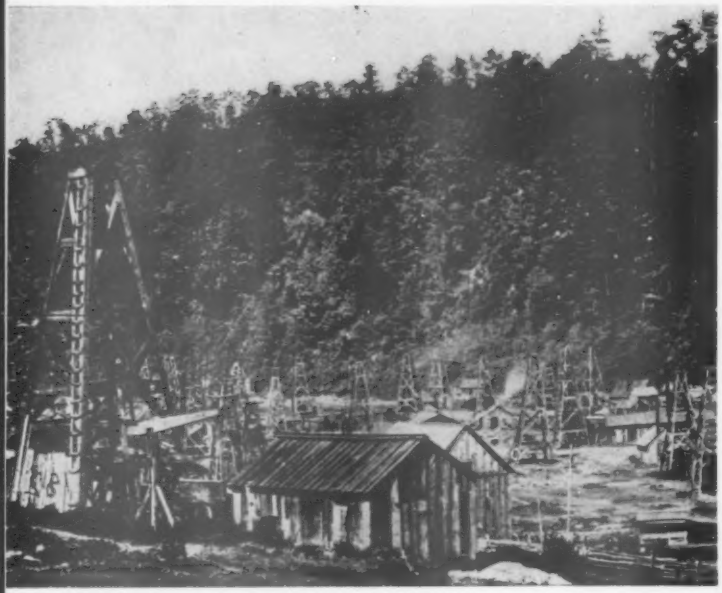
John M. Nagle, 51, buyer for Humble Oil & Refining Co., died recently of a heart attack in Houston.

J. B. LeFlore, 49, area gaging superintendent for Shell Oil Co., New Orleans, died following a heart attack recently.

Luther E. Taylor, 61, assistant superintendent of the production department of Humble Oil & Refining Co. at Houston, died May 14. He had been with Humble since 1919.

Francis H. Marling, 59, advertising manager of Pure Oil Co., died May 18 at Glencoe, Ill.


INTEGRITY AND SERVICE
90th Anniversary
"OILWELL"
1862-1952
YEAR AFTER YEAR



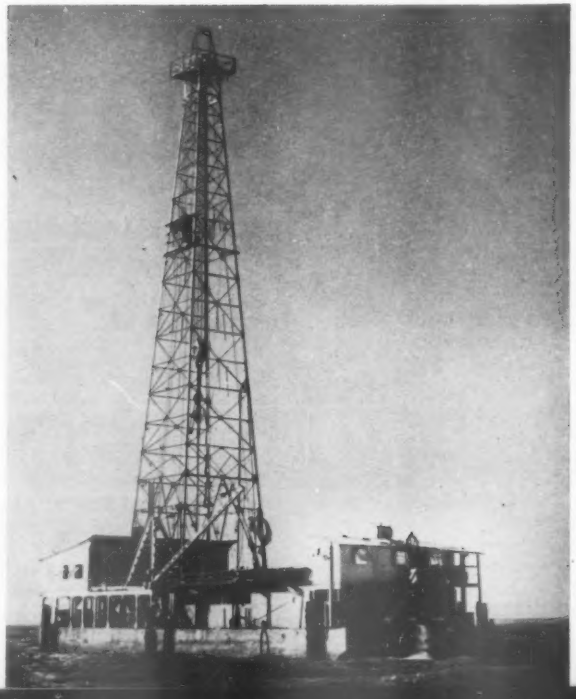
YESTERDAY . . . Funkville, Pa., in 1863, with the Empire well, which was completed in September 1861.

In the beginning . . .

JOHN EATON
Founder, Oil Well Supply Co., now Oil Well Supply Division of United States Steel Co.

"Mr. John Eaton, president of the Oil Well Supply Co., has been in the oil-well supply business since the fall of 1861, and can therefore be properly called the father of the business. No other such person connected with the business has been in it any such length of time."

—From The Derrick Publishing Co.'s Hand Book of Petroleum, published in 1898 at Oil City, Pa.



TODAY . . . Offshore location in the Gulf of Mexico, being drilled by Dixon Drilling Corp., using an "Oilwell" 64-B rig.

90 Years . . .

BY TIME ALL THINGS ARE PRODUCED AND JUDGED. – NAZIANZEN

NINETY YEARS *is a full measure of time.* ¶ *What has endured has done so for a cause. Among men, that cause is justice however manifested in actions or in things. Justice in a business institution is marked by integrity — the integrity of its people, its products and its services.* ¶ *This is only the seed for a beginning, flowering into an established creed. It becomes a heritage to be entrusted to worthy stewards from generation to generation.* ¶ *The passing scene is one of change yet integrity of purpose stands as the keystone for enduring enterprise.* ¶ *In looking forward there is always the exacting yardstick of service constantly applied from yesterday through today and projected into tomorrow.* ¶ *Constructive as well as creative work comes by evolution rather than by revolution. It relies upon the sound criteria of the past for its guideposts to the future.* ¶ *Ninety years . . . A tribute to the past; a promise for the future.*

Frederick Murray

President, Oil Well Supply
Division of
United States Steel Company

Here are the men who direct "Oilwell"

FRED F. MURRAY
President
Dallas

RALPH W. RAGER
Vice president
Dallas

LLOYD E. TRACY
Vice president—Sales
Dallas

G. FRED GOETZINGER
Treas. & gen. credit mgr.
Dallas

MIKE F. HAZEL
Director of engineering
Dallas

FRED E. LINK
Assistant to president
Dallas

O. J. FISTER
Ass't to vice president
Dallas

H. M. DRAKE
Ass't to vice president
Dallas

ALEX QUAYLE
Chief engineer
Dallas

C. J. KEIM
Chf. eng. Imperial Wks.
Oil City, Pa.

W. J. REDMAN
Chf. eng. Wilson-Snyder
Wks.—Braddock, Pa.

K. B. WINSTEAD
Gen. mgr. of sales
Dallas

K. CHICKERING
Gen. sales staff mgr.
Dallas

GEORGE A. HAYS
Director, market
development—Dallas

CLAUDE A. BELL
Mgr. drill. equip. sales
Dallas

F. D. SMITH
Asst. to gen. mgr. of
sales—Dallas

CARL C. EGNER
Mgr. ref. & P.L. equip.
sales—Dallas

MAX E. SHIPPEE
Dir. advertising & sales
promotion—Dallas

PAUL H. SHEPHERD
Asst. mgr. tubular sales
Dallas

R. R. McAFEE
Asst. mgr. tubular sales
Pittsburgh

CHAS. E. WEAVER
Project engineer
Dallas

R. L. ARMSTRONG
Area manager
Casper, Wyo.

MARK BARKHURST
Area manager
Tulsa

S. P. GLASGOW
Sales mgr. Neilsen Pmp.
Wks.—Long Beach, Cal.

N. E. MEYER
Mgr. sales Wilson-Sny-
der Wks.—Braddock, Pa.

M. E. NICKLIN
Mgr. sales White Engine
Wks.—Kansas City, Mo.

PAUL E. POTTKER
Asst. mgr. sales White
Eng. Wks.—Kansas City

WARNER F. PARKER
Area sales manager
Los Angeles

H. D. WHITE
Area mgr. ref. & P.L.
eqp. sales—Los Angeles

. . . its management . . . manufacturing . . . sales . . . servicing

DAN H. BARR
Gen. mgr. prod. plan. & procurement—Dallas

GORDON M. AMSTUTZ
General works manager
Dallas

ERWIN P. KRAATZ
Comptroller
Dallas

JOHN C. IRWIN
General attorney
Dallas

LESTER H. KEIM
Vice president
Oil City, Pa.

FRANK J. KOGEL
Chf. eng. Witte Engine Wks.—Kans. City, Mo.

E. E. STEVENSON
Chf. eng. Neilsen Pump Wks.—Long Beach, Cal.

ROY L. CHENAULT
Chf. research engineer
Oil City, Pa.

S. A. KNAPP
Patent engineer
Oil City, Pa.

E. W. JOHNSON
Centrifugal pump engr.
Braddock, Pa.

F. LEE CURRENT
Chief metallurgist
Oil City, Pa.

JOHN S. FULLER
Mgr. prod. equip. sales
Dallas

J. M. HAYNES
Asst. mgr. eng. & comp. sales—Dallas

J. E. MILLER
Field dev. engineer
Dallas

J. M. POST
Mgr. tubular sales
Pittsburgh

W. C. RAMSEY
Mgr. eng. & comp. sales
Oil City, Pa.

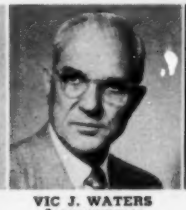
M. D. ROUTZON
Mgr. mdse. claims
Dallas

D. R. CUMMING
Area manager
New York

DON S. GRUBBS
Area manager
Los Angeles

C. H. MAYNARD
Area manager
Columbus

MELVIN F. JONES
Area manager
Houston



VIC J. WATERS
Area manager
Dallas

W. A. WEIR
Area manager
Calgary, Alta.

R. T. WATKINS
Area engineer
Los Angeles

ERIC LEMKE
Area mgr. drlg. equip. sales—Los Angeles

J. P. O'NEILL
Area mgr. prod. equip. sales—Los Angeles

L. T. TIDWELL
Area engineer
Calgary, Alta.

B. H. RAVANELL
District manager
Edmonton, Alta.

R. T. SHOEMAKER
Area mgr. prod. equip. sales—Dallas

W. G. SMITH
Area mgr. tubular sales
Dallas

RALPH HADDOX
Area sales manager
Columbus

L. A. HUMPHREYS
Area engineer
Columbus

LESTER M. WOLTZ
Area tubular rep.
Columbus

GEORGE L. BENSON
City representative
Chicago

H. W. BOOTH
Area engineer
New York City

H. E. BIVINS
Area mgr. subsurface
sales—Tulsa

L. A. WEINGART
Area mgr. ref. & P.L.
eqpt. sales—Ponca City

R. D. STONE
District manager
Long Beach

E. W. CLARE
Asst. district manager
Bakersfield, Calif.

WM. MISKIMINS
District manager
Wichita Falls, Tex.

D. O. SMITH
Asst. area manager
Midland, Tex.

G. A. FORD
Rep.—San Fernando,
Trinidad, B.W.I.

C. T. DOLAWAY
Representative
Maracaibo, Venezuela

H. B. TRACY
District manager
Lake Charles, La.

J. R. COBURN
District manager
New Orleans

B. A. AUGUST
District manager
San Antonio

T. E. DAWSON
District manager
Wichita

F. G. IRICK
Sales office manager
Great Bend, Kans.

SCOTT T. LUTZ
Sales office manager
Wichita

A. D. OTTO
Sales office manager
Denver

BYRON POST
Sales office manager
Fort Worth

D. R. SMITH
Sales office manager
Ponca City, Okla.

T. E. BOWERS
Merchandise manager
Midland, Tex.

G. SCHOOLCRAFT
Merchandise manager
Casper, Wyo.

R. M. SHERRARD
Merchandise manager
Olney, Ill.

L. L. MITCHELL
Asst. treas. & gen.
credit mgr.—Dallas

JIM DALRYMPLE
Area credit manager
Los Angeles

JOHN C. DONAHUE
Area credit manager
Columbus

G. A. HANSON
Area credit manager
Dallas

G. E. GRATZ
Mgr. pricing section
Dallas

T. E. REGAN
Mgr. Imperial Works
Oil City, Pa.

C. M. MOCHEL
Pur. agt. Imperial Wks.
Oil City, Pa.

C. H. STEWART
Mgr. Wilson-Snyder
Wks.—Braddock, Pa.

D. M. HOCHSWENDER
Mgr. Witte Engine Wks.
Kansas City, Mo.

JOHN O. EPPRIGHT
Pur. agt. Witte Engine
Wks.—Kans. City, Mo.

T. B. SHAUGHNESS
Area engineer
Houston

J. E. SHOEMAKE
Area mgr. ref. & P.L. eqp. sales—Houston

J. A. FISHER
Area mgr. machinery sales—Houston

R. F. CANN
Area mgr. tubular sales
Houston

WM. HELDMAN
Asst. area manager
Tulsa

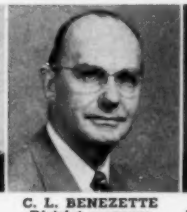
G. I. WYCKOFF
Area engineer
Tulsa

J. B. CALLAWAY
District manager
Shreveport

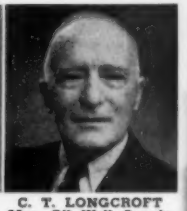
J. W. BIBB
District manager
Bradford, Pa.

J. P. O'TOOLE
District manager
Evansville, Ind.

H. C. WRIGHT
District manager
Charleston, W. Va.



C. L. BENEZETTE
District manager
Mt. Pleasant, Mich.



C. T. LONGCROFT
Mgr. Oil Well Supply Co., Ltd.—London

PAT KENNON
District manager
Oklahoma City

A. S. FINEFROCK
District manager
Billings, Mont.

H. E. RITCHEY
Dist. mgr. Nelsen Pmp. Wks.—Taft, Calif.

C. A. BAKER
Sales office manager
Bartlesville, Okla.

JON S. BLYTH
Sales office manager
Pittsburgh

CARL F. FISCHER
Sales office manager
Chicago

G. LEE FABJ
Merchandise manager
Harvey, La.

J. H. FENTON
Merchandise manager
Wichita Falls, Tex.

G. A. JACKSON
Merchandise manager
Oklahoma City

L. D. KINNAN
Merchandise manager
Houston

K. J. MILLER
Merchandise manager
Edmonton, Alta.

RANDOLPH PITTMAN
Merchandise manager
Alice, Tex.

BOB MOSELEY
Area credit manager
Calgary, Alta.

W. C. PHILLEY
Area credit manager
Houston

CARL WITTUM
Area credit manager
Tulsa

R. E. DICKSON
Assistant to gen. mgr. P.P.&P. dept.—Dallas

E. H. WESTFALL
Purchasing agent
Dallas

ROY K. HALL
Gen. traffic manager
Dallas

R. K. BAKER
Mgr. Nelsen Pump Works—Long Beach

DEWEY R. MOORE
Supt. Garland Works
Garland, Tex.

J. H. FINLEY
Asst. comptroller
Dallas

GEORGE GASSER
Tax supervisor
Dallas

R. E. SCHOCH
Auditor Imperial Wks.
Oil City, Pa.

LUTHER A. TILMAN
Auditor Wilte Engine Wks.—Kans. City, Mo.

PITHOLE, PA., 1865... One of the early-day fields near where Drake drilled the first commercial well.

EXPOSITION FORERUNNER... was this 1898 Oil City, Pa., fair where "Oilwell" exhibited its extensive line of geared-type central powers.

. . . Oil and "Oilwell" Have

WHEN "Colonel" Drake drilled his famous well which started the oil industry, his "supply store" was a local blacksmith, "Uncle Billy" Smith. So Drake really discovered two things: That oil could be produced by drilling for it, and that a lot of very special equipment was needed on the spot.

For the next couple of years, as derricks began to sprout up and down Oil Creek, blacksmiths continued to be the suppliers of the infant oil industry, and every driller designed or improved his own equipment. But it was soon evident that something more was needed, and so the supply industry was born.

And the very first supply firm is still going strong and has been operating and expanding continuously since its founding back in the dark ages of the oil industry. Now known as the Oil Well Supply Division of United States Steel Co., it is celebrating its ninetieth birthday this year—which makes it, for all practical purposes, as old as the oil industry itself.

How Oil Well Supply got started, how it had to stay on the jump to keep up with the oil industry, and how it managed to develop its present size and form—these make a history which parallels the history of oil itself and which is just as interesting in many of its aspects.

When Drake brought in that historic well in the summer of 1859 he used a string of tools modeled after those used by salt-well drillers, and Uncle Billy hammered them out on his forge right on location. When the well caved in they drove down a hollow log and drilled through it, thus inventing well casing. And when oil rose part way up the 69-ft. hole they borrowed a pitcher pump from a farm kitchen, which became the world's first oil-well pump.

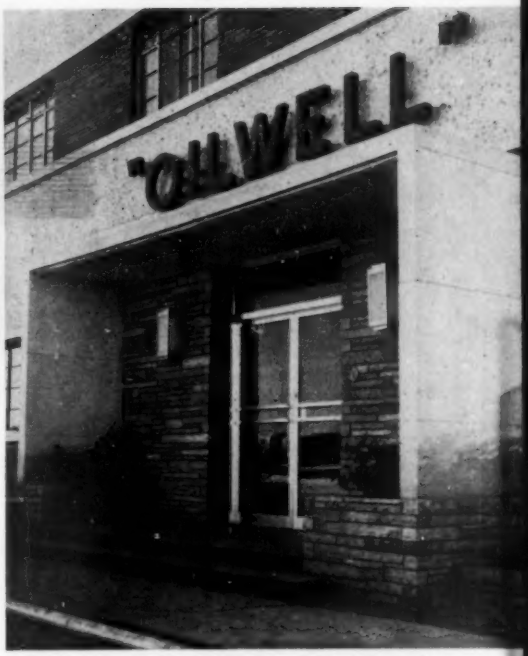
Such was the sort of equipment used in that first oil boom in the wilds of western Pennsylvania. Within months after Drake's discovery, the nearby creek bottoms were swarming with men punching holes into the earth by any means they could devise. The drilling "technology" of those days was mostly sweat and determination, and the equipment was almost anything that could be picked up and made to serve.

Hundreds of people flocked to Oil City, the center of the boom, and among them was a shrewd Yankee "pig-iron peddler" named John Eaton who resisted being bitten by the oil bug but who saw an opportunity to fill the equipment needs of the new industry.

So John Eaton stayed in Oil City and kept very busy making and filling orders from drillers for supplies of all kinds. Thas was in 1862, just 3 years after Drake started it all. Thus Eaton became the world's first oil-well supply man, and he kept at it continuously all the rest of his working life.

During his first years in Oil City, Eaton was little more than a broker or order taker, picking up supplies and equipment where best he could

SKID-MOUNTED PUMPING UNITS... with self-contained reduction gears were introduced in time for the East Texas boom days of the 1930's.



ODESSA, TEX., district warehouse and office, from which "Oilwell" serves the Permian basin in West Texas and New Mexico.

Grown Up Together

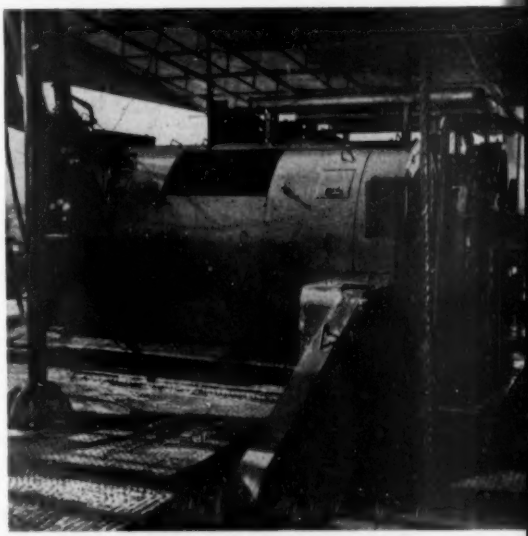
or having them put together by local blacksmiths and mechanics. But as the business grew and Eaton decided that oil was here to stay, his Yankee ingenuity came up with several innovations which launched him on a great and constantly expanding business career.

A Year of "Firsts"

The year 1867—5 years after Eaton started the business—was marked by several "firsts" in the oil-equipment industry.

That year Eaton, Cole & Burnham, of which John Eaton was the founding partner, entered the manufacturing business and opened the first shop to produce equipment specifically and exclusively for the oil industry. It was a small machine and blacksmith shop on Sycamore Street in Oil City, not really a factory at all. It fabricated wooden bull wheels, forged drill bits, riveted sheet iron into bailers, and turned out temper screws and other fittings for the crude derricks and drill strings of those days.

This was before the days of general standardization of screw threads, and this operation gave Eaton a chance to make a start on a project he had had in mind for some time—standardization of drilling equipment. With

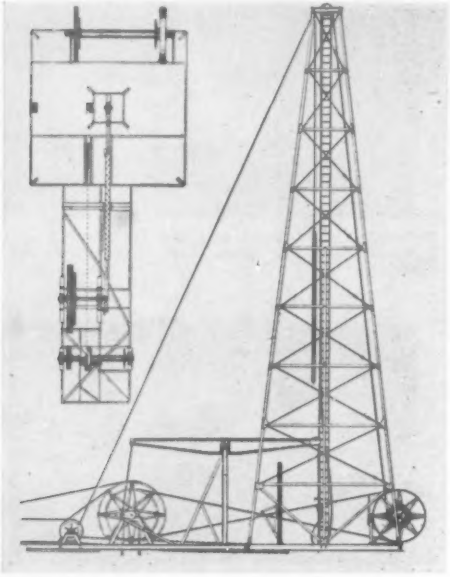


NO. 76 RIG... designed for 6,000-10,000-ft. drilling, has features similar to the No. 96. It was introduced in 1950.

"... and the very first supply firm is still going strong and has been expanding continuously since its founding... 90 years ago."

INNIS ENGINES . . . were ahead of their time in design features as shown here from "Oilwell's" 1892 catalog.

MOGUL STEAM ENGINE . . . saw service in early Spindletop days and was honored at Spindletop's anniversary last year.



FIRST STEEL RIGS . . . as shown in the 1892 catalog included a 72-ft. derrick with samson post, etc., made of steel.

every driller or his blacksmith designing his own tools, there was no uniformity in the equipment; and the pins, boxes, and couplings made in one shop wouldn't fit those from another source.

In his Oil City shop Eaton drew up his own specifications and standardized on a uniform line of equipment with interchangeable parts. Drillers soon found that purchasing uniform equipment out of stock was much better than having things custom made, and so the oil industry's standardization program got its start.

Years later, until the American Petroleum Institute took up the standardization work after World War I, "OWS" standard threads were a byword throughout the oil industry.

In that same year 1867, Eaton introduced standardized casing and tubing to the industry. He sold the first wrought-iron pipe with threads and couplings used in the oil fields, and the first string was used in the second well drilled in Bradford field. Prior to that, wells had been cased with unthreaded pipe shoved down stovepipe fashion. He also had the Tauton Iron Works of Tauton, Mass., make the first tubing expressly for oil-field service, described by him as "butt-welded, made in long lengths, with heavy couplings, the ends reamed by machinery and blisters removed."

It was 1867 also which saw the industry's first supply store. Eaton opened it in Oil City in

MILESTONES IN OIL'S HISTORY

1859

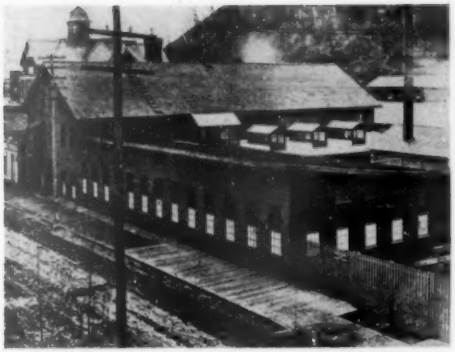
Col. Edwin L. Drake completes the first well drilled for petroleum in the United States. The well, located on the banks of Oil Creek near Titusville, Pa., touched off a rapid development program in the Appalachian region.

1860

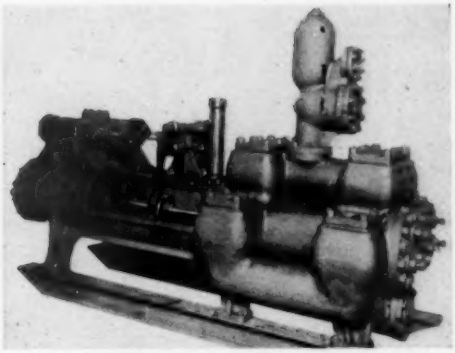
William Barnsdall and William H. Abbott construct the first oil refinery to be built in the Oil Creek, Pennsylvania, fields near Titusville. By year's end, refineries were in operation in major cities of the Appalachian region and the Atlantic seaboard.

1870

Standard Oil Co. of Ohio is incorporated at Cleveland by the Rockefeller interests with a capitalization of $1,000,000. This marks the entrance into the oil industry of well-organized, integrated corporate capital.



ENGINE WORKS... Oil Well Supply Co., Ltd., one of plants devoted to manufacture of materials for the oil industry—1889.



STEAM SLUSH PUMPS... with long 18-in. stroke, were introduced by Wilson-Snyder in 1926.

order to stock articles needed by the rapidly expanding oil business in Venango County so that equipment and supplies would be readily at hand and not have to be ordered from distant points. That first store, incidentally, is still operating after 85 years—a lot longer than anyone then thought oil would last.

Oil-Well Supply Store

Nowadays the layman may wonder a bit at application of the word "store" to what in any other industry most likely would be called a warehouse or field office. But the old-time oil-well supply store, the pattern for which was set by Eaton in Oil City, was really a store, very much like the old-fashioned general store at a country crossroads.

This first store, and the many others which followed it, stocked not only special oil-field equipment but also a general line of hardware used by drillers and producers and also anything else these men might need—work clothes, tools, cooking utensils, and chewing tobacco.

In addition, the store became a sort of a clubhouse for oil men, their gathering place whenever they came to town. On Saturday nights the drillers and wildcatters would come in from the creeks and hills and sit around the pot-bellied stove and spit in the sawdust while

CORSICANA, TEX., STORE... This was Oil Well Supply's first store west of the Mississippi River, opened in 1897.

exchanging yarns and gossip. Here they picked up tips on drilling and leasing activity, where the newest hot play was, and latest wrinkles in the art of pushing down a well.

They got their mail at the supply store, left messages there for each other, and asked the supply-store man to do errands for them when they coundn't get into town. Thus the supply store became a sort of unofficial employment agency, lease-brokers' curb, information center, petroleum club, and general friend-in-need for all the oil men of the region.

1878

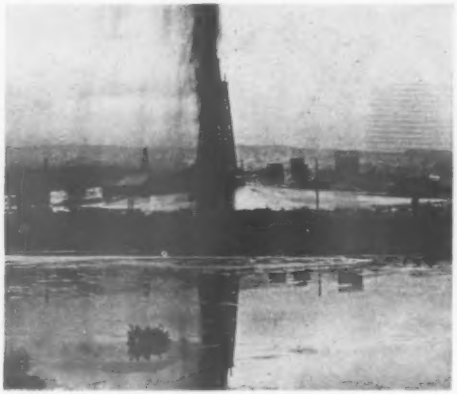
Bradford oil field in northern Pennsylvania makes its impact on the oil industry. It produced 6,500,000 bbl. during the year which is 42 per cent of the total output for the United States. Bradford is the first of the major oil fields of the nation.

1885

A. J. Zylker, a tobacco planter, finds oil near his plantation northwest of Medan in North Sumatra at a depth of only 400 ft. This first productive well, in what is now Indonesia, leads to the founding of Royal Dutch Petroleum Co.

1899

Max Livingston, of Atlantic Refining Co., perfects the continuous operation for shell stills in a battery installed at their Point Breeze (Philadelphia) refinery. The method, quickly adopted by other refiners, replaces the batch-still distillation technique.



MIDWAY . . . Fabulous 1 Lakeview gusher which thundered in on March 15, 1910. (Courtesy Union Oil Co. of California.)

ROMANIA . . . Headquarters of Ralph E. Fair, in Ploesti, outlet for much of "Oilwell" equipment used in Ploesti field.

During the next decade the oil-field business of Eaton, Cole & Burnham expanded rapidly in western Pennsylvania, and in 1878 the partnership changed its name to Oil Well Supply Co., Ltd., and devoted itself exclusively to this business. By that time it had stores operating in Petrolia, Edinburg, Scrubgrass, Bradford, and Karnes City, Pa., all of them booming oil towns of that period.

Under its descriptive name of Oil Well Supply, the firm was now so well known that in 1879, A. B. Nobel, the Swedish industrialist and inventor of dynamite, came to it for machinery, men, and technical advice for the development of the rich Baku oil fields of Russia. This was the first available record of Oil Well Supply's entry into the international market, but thereafter its equipment was used almost everywhere in the world where oil was developed.

That decade also saw the start of two other enterprises which much later became parts of the "Oilwell" family. Out in Kansas City, Mo., far from where anyone thought of discovering oil, a steam-engine designer named August Witte opened a shop in 1870 to make small steam engines and farm equipment. In 1874, in what is now the "Golden Triangle" of Pittsburgh, Robert J. Wilson and August Snyder formed a partnership to manufacture valves and fittings for general service. Both enterprises prospered, and eventually both Witte Engine Works and Wilson-Snyder became parts of Oil Well Supply.

Period of Great Expansion

The 1880's were a period of great growth for Oil Well Supply, paralleling the expansion of the oil industry throughout the world. "Particular attention paid to foreign orders" read the advertisements which the firm ran during that period, and it is a matter of record that its equipment was being used in the oil fields of Russia, Austria, Hungary, Romania, Cuba, Australia, Central America, Mexico, Italy, and Germany. Not content with selling abroad, John Eaton toured foreign oil operations in search of equipment ideas, and in 1886 he brought back from the Baku and Romanian fields a model for an underreamer which he started manufacturing in Oil City and introduced to the drillers of this country.

The Oil Well Supply shop in Oil City was making its own steam engines early in the

1901

Anthony F. Lucas, mining engineer, and J. M. Guffey Co. of Beaumont, Tex., discover the first major oil field in the Southwest—Spindletop, Tex. The discovery marked the birth of rotary well drilling and brought the Southwest to the forefront.

1901

The Mexican Petroleum Co. of California discovers oil in commercial quantities west of Tampico, Mexico, in what is now known as the Northern District field. The following year, oil is discovered in the Isthmus of Tehuantepec.

1902

Three crude-oil refineries commence construction near Beaumont, Tex. These are predecessors of Gulf Refining Co., The Texas Co., and Magnolia Petroleum Co., forming the heart of one of the world's largest crude-oil refining centers.

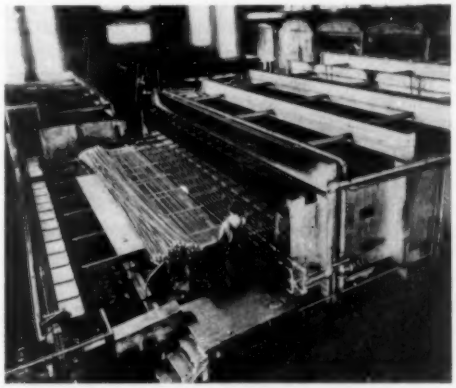
CALGARY, ALTA.... Lineup of investors waiting their turn to buy stock following completion on May 15, 1914, of the Dingman well—western Canada's discovery well.

1880's under the trade name of Mogul. By 1889, however, the demand for engines for drilling and pumping was so great that Oil Well Supply purchased the Innis Engine Works of Oil City and added Innis engines and pumps to its growing line of equipment. Innis engines were of advanced design for their time, being of balanced piston-valve construction with double eccentric link motion, made in both single and twin-cylinder models.

In 1886 also the business was expanding so greatly that Oil Well Supply moved its general offices to Pittsburgh in order to be close to the source of many of the supplies it carried. Three years later, in 1889, the firm started a manufacturing plant in Pittsburgh, to supplement its other shops, and this eventually became the largest plant in the world devoted to manufacturing drilling tools.

The "Gay Nineties" were active and probably also gay for "Oilwell," for during that decade it reached a maturity which was to stand it in good stead a few years later when the oil industry burgeoned into Texas and the Mid-Continent.

In 1891, the partnership of Oil Well Supply Co., Ltd., incorporated as Oil Well Supply Co., and a Pennsylvanian charter was issued March 19, 1891. The next year it purchased the Continental pipe mill in Pittsburgh, which it operated until 1899 when it sold the mill to National Tube Co. but continued to distribute its tubular goods.



FIRST COMPLETE HEAT-TREATING FURNACE . . . for the manufacture of fully heat-treated sucker rods in commercial quantities was installed at Imperial Works in 1933.

1904

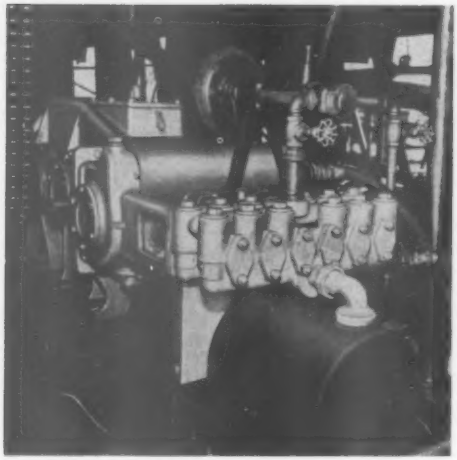
Standard Oil Co. (Ind.) builds a 500-mile 6-in. crude-oil pipe line from Kansas City to its refinery at Whiting, Ind. This comprises the first outlet for southwest crude oil and spurs development in Kansas and Oklahoma.

1905

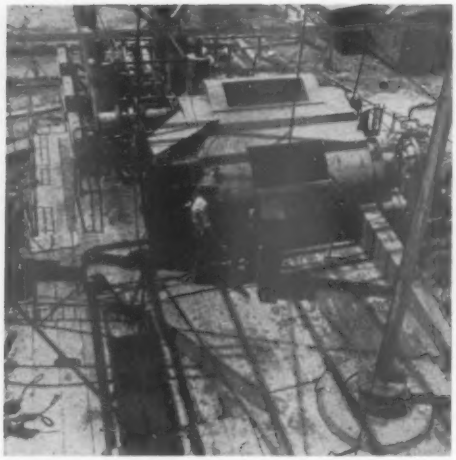
Robert Galbraith and Frank Chesley discover oil at Glenn pool near Tulsa. Glenn pool produced as high as 120,000 bbl. a day, the largest flush producer in the nation up to that time. By the following year it was the leading crude source in the Southwest.

1906

Savage Brothers discover Caddo oil field in North Louisiana. It becomes the largest oil field in Louisiana during the next 4 years to outrank Jennings, Welsh and Anse La Butte.



BRANTLY ROTARY FEED CONTROLS . . . maintain preselected weights on drill bit by regulating wire-line feedoff rate from draw works to correspond with changes in formations.



NO. 96 RIG . . . for heavy-duty drilling, sets new convenience and performance standards by air controlling all remote operating assemblies. Rig first saw service in 1945.

A "Complete Steel Rig for Drilling Wells" was featured in the company's 1892 catalog, another innovation which was slow to be widely adopted by the oil industry. Every part was made of steel, including the 72-ft. derrick, samson post, walking beam, band wheel, bull wheels, and other parts. The first rig of this type was sold in Australia, where wood was scarce and decayed rapidly. It was not until years later that steel derricks completely displaced wood in the United States.

About this time Oil Well Supply began experimenting with the new internal combustion engine, and brought out its line of "Simplex" engines to operate on natural gas. Its 1900 catalog listed eight sizes, ranging from 5 to 50 hp. These were used chiefly for pumping rather than drilling, as the power rig did not offer a serious threat to steam drilling until many years later.

By this time oil production was well established in California, and to serve these fields Oil Well Supply made an arrangement with R. H. Herron, a Los Angeles hardware dealer, to distribute its lines on the West Coast. Later Oil Well Supply absorbed this house and carried on the business in California under the "Oilwell" name.

But the first real "Oilwell" store west of the Mississippi River was established in Corsicana, Tex., in 1897, very soon after the first commercial discovery of oil in that state. In 1900, Oil Well Supply followed the industry into Colorado and opened a store in Florence, Colo.

With the demand for equipment constantly enlarging, Oil Well Supply opened a boiler shop in Oswego, N. Y., in 1900, and that same year it purchased a new site of 50 acres at Oil City and began construction of a factory to replace its outgrown shops there and also the Pittsburgh factory. This was the Imperial Works, which is still operating and which grew to become one of the largest single factories in the world devoted exclusively to the production of oil-industry equipment.

By the turn of the century the "Oilwell"

1908

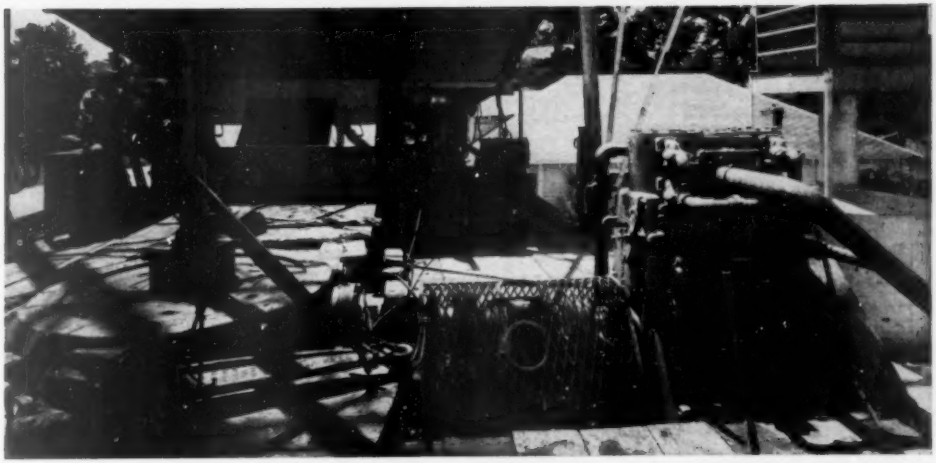
William Knox D'Arcy strikes oil at Masjid-i-Sulaiman, Iran, at a depth of 1,180 ft. This marks the first petroleum discovery by this explorer on his Iranian oil concession granted him in 1901.

1912

C. B. Shaffer & Associates discover Cushing oil field in eastern Oklahoma. This major oil field, with a reserve of more than 450 million barrels, breaks the oil market 2 years later.

1913

The first commercial installation of the thermal cracking process is placed in operation for Standard Oil Co. (Ind.) at Whiting, Ind., in January. Dr. William Burton of Standard is inventor of the process which employs 250-bbl. shell stills.



ROTARY DRILLING UNITS . . . provide power for the rotary independent of the draw works, and are compactly assembled on portable skids. Earliest units were steam driven, but today's units achieve the same smooth operating characteristics from internal-combustion engines by including a torque converter in the drive assembly.

trade mark was well and favorably known throughout the world, and the company demonstrated its stature at the Paris Exposition in 1900. On the fairgrounds it set up one of its most modern cable-tool rigs and under direction of Louis C. Sands, who later became the firm's export manager, drilled a water well to a depth of 1,950 ft. in 35 days with a crew of five men. This astonished foreign drillers, for the best French record was 3 years for a well of similar depth. This water well drilled as a demonstration in 1900 is still in use today.

The lid blew off the oil industry in 1901 when Captain Lucas' gusher blew in on Spindletop Mound, near Beaumont, Tex., the biggest well in history at that time. Spindletop was the start of many important developments in the industry—the beginning of production on the Gulf Coast, the birthplace of several large oil companies, and the first major use of rotary drilling rigs.

Crude rotary rigs had been developed in the Mid-Continent for drilling water and salt wells, and a few oil wells had been drilled with rotaries without attracting much attention. But the Spindletop well could not have been drilled by cable tools because of the quicksand and the high gas pressures encountered. Oil Well Supply was not making complete rotary rigs at that time, but individual pieces of its equipment helped to bring in Spindletop, for Lucas' rig was powered by a 25-hp. boiler and a single-cylinder steam engine bearing the "Oilwell" trade mark.

Expanding World Market

The Spindletop discovery coincided with a sudden great demand for fuel oil for steam generation as well as expanding world markets for kerosine, so even though gasoline was still not a commercial product the market for oil was so great that drillers spread rapidly over large areas of Texas, Louisiana, and the Mid-Continent. Oklahoma (then Indian Territory) became a major oil-producing area with the development of Glenn Pool in 1906 and the construction

1913

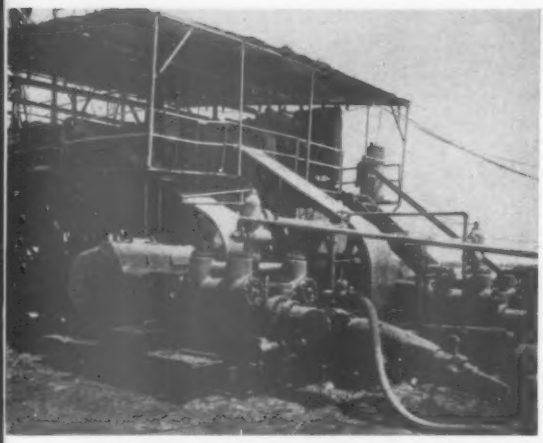
Hope Natural Gas Co. constructs a 40,000-gal. capacity absorption-type natural gasoline plant at Hastings, W. Va. It is credited with being the first large-size absorption plant.

1914

Caribbean Petroleum Co. discovers Mene Grande oil field near the eastern shores of Lake Maracaibo. Drilled downdip from one of the principal oil seepages, this area comprises the earliest commercial oil field in Venezuela.

1917

Oil is discovered at Ranger in Eastland County, Texas. This brought about the first large postwar oil development. Ranger crude production hits 80,000 bbl. daily by July 1919.



20-IN. STROKE... Here is the first power slush pump with 20-in. stroke, forerunner of today's heavy-duty "Oilwell" No. 220-P. It was introduced late in 1936.

of the world's first long-distance pipe lines from there to the Gulf of Mexico.

This brought rapid development to Oil Well Supply Co. Between 1900 and 1910 it opened supply stores at such widespread points as Beaumont and Wichita Falls, Tex.; Tulsa, Okla.; Los Angeles, Taft, and Bakersfield, Calif.; Shreveport, La.; Clarksburg and Charleston, W. Va.; and Bridgeport, Ill. It also opened an office in London, England, to serve its foreign customers, and took over the West Coast distributor, R. H. Herron & Co., and built a manufacturing and service shop in Los Angeles.

From the first hectic oil booms of the early 1900's until World War I the oil industry's history was marked by many discoveries in new areas which caused chronic oversupplies of crude, by a slowly expanding market for petroleum products, the beginning of a demand for motor fuel, and by the beginnings of modern refining techniques. It also brought many advances in drilling practices and in drilling equipment, and Oil Well Supply had its share in these.

Shortly after the turn of the century Oil Well Supply began offering a line of all-steel cable-tool rigs mounted on wheels, known as Columbia Drillers. These were a far cry from the modern rig, being little more than skid-mounted rigs set up on large iron wheels so that teams could pull them to location. They were, however, quite effective, particularly because drillers soon discovered how to modify them into rotary rigs. Such incidents illustrate as well as anything could the fact that Oil Well Supply, for all its initiative and ingenuity, often received from its customers the ideas and suggested designs for many of the new products it brought out over the years.

One-Piece Steel Sucker Rod

One innovation for which Oil Well Supply takes full credit is the one-piece steel sucker rod, which it introduced in 1908. Until then sucker rods were made of wood fitted at each end with wrought iron couplings, but "Oilwell" all-steel, integral-joint development revolutionized sucker-rod manufacturing, and the basic design is still in use today.

TRIPLEX PLUNGER PUMPS... were designed expressly for water-flooding service and the first major application of a battery of these pumps was made by South Penn in Bradford field during 1945.

Rotary drilling rigs were making a strong

1919

Traders Oil Corp. 1 Boles, a wildcat well located a few miles west of Liberal in southwestern Kansas, taps one of the world's largest natural-gas fields—Hugoton. The field produces from several porous Permian limestone reservoirs at a depth of 2,800 ft.

1920

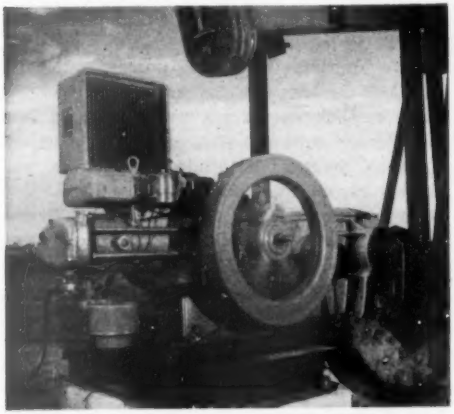
Ralph C. Holmes and Frederick T. Manley, of The Texas Co., construct at Port Arthur, Tex., the first large installation of the Holmes-Manley cracking process. By 1928 there were more than 150 of these units in operation throughout the United States.

1924

Gulf Oil Corp. discovers the Orchard salt dome near Houston with the refraction seismograph. This marks the first seismic discovery and introduces a new technique to outline shallow salt domes, most of which produce oil.

bid for favor shortly before the first World War, and Oil Well Supply contributed to their advance with the development of the "Mud Hog" pumps which became standard of their day. Some models were equipped with gear-reduction power frames even in these early days of rotary drilling. Another famous "Oilwell" trade mark made its appearance about the same time with the advent of the "Black Bear" gas engines.

Pumping in those days was largely by central "powers" from which rod lines radiated in all directions, and Oil Well made several different lines of steel bandwheel and geared-type central powers. But it also pushed its line of steel individual-well pumping units for deep wells, equipped with open-type gearing for speed reduction and available with built-in or attachable service hoists.



OIL-FIELD ENGINES... from Witte Engine Works were first introduced by "Oilwell" during 1946. The line now includes gas-gasoline or diesel models which cover a range of from 5 to 15½ hp.

As a prime mover for well pumps, the company developed a vertical single-cylinder, air-cooled gas engine of 4 hp., transmitting power through an "Oilwell" friction clutch especially designed for this service.

In 1911, nearly 50 years after he pioneered the oil-well supply business, the firm's founder,

PORTABLE DERRICKS... of this advanced design are assembled at ground level and literally "walk themselves up" into drilling position on their substructures.

John Eaton, retired as president and Louis Brown, who had been vice president, became the second president of Oil Well Supply Co. During the next few years the company continued to open supply stores in new areas as the oil industry expanded geographically, but the most notable event was the discovery of oil in Alberta, Canada, by the Dingman well in 1915. Along with other suppliers, Oil Well Supply promptly moved into Alberta and, unlike some others, it stuck through the many lean years which followed and was well entrenched there at the time of the later-day oil boom in the Prairie Provinces.

Shortly before the Kaiser's troops marched toward the English Channel in 1914 Oil Well Supply donated a complete drilling rig to the new petroleum engineering school at the University of Birmingham in England. At the

1926

One of the world's largest and most prolific oil fields is opened on the Yates ranch in Pecos County in West Texas. Three years later open-flow capacity from 309 wells reached 4,500,000 bbl. a day. One well flowed at the rate of 204,681 bbl. per day.

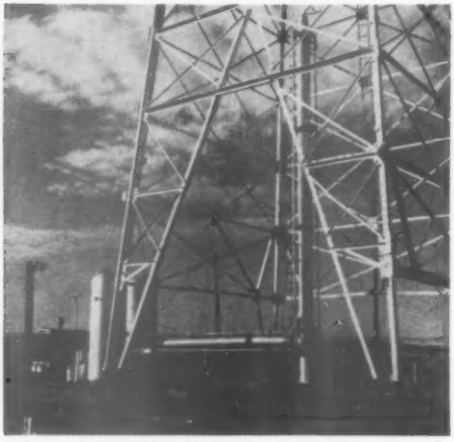
1927

The Greater Seminole region of central Oklahoma breaks the crude-oil market. Ten major pools of the region produce 527,400 bbl. daily on July 30. The first major application of state-enforced proration results.

1927

Iraq Petroleum Co. et al discover oil on their concession at Kirkuk in Iraq. Development outlined production for a length of about 50 miles from Eocene and Miocene porous limestones.

STREAMLINED TRAVELING BLOCKS . . . of extremely narrow construction for heavy-duty service, were introduced in 1948.



HYDRAULIC PUMPING UNITS . . . were added during 1951, when "Oilwell" acquired the Harcraft line for long-stroke operations.

height of the war the British Government purchased nine complete "Oilwell" rigs and was given much technical assistance in tis search for oil in England.

The end of the First World War found the United States in the beginning of the motor age, with a tremendous interest in technology, and facing a threatened oil shortage. That combination spawned a widespread rush for more oil discovery and production which brought with it a fast development in oil equipment.

Imperial Rotary Introduced

Oil Well Supply contributed to this, and shortly after the end of the war it brought out its Imperial Rotary, described as "the only rotary ever manufactured which successfully 'makes up' and 'breaks out' casing, drill pipe, and tool joints without manual labor, performing this in less than half the usual time." But here again Oil Well Supply was somewhat ahead of the industry, for the use of power to make and break strings did not come into general use until many years later.

Much greater immediate success met two other "Oilwell" innovations. One was a rotary table with spiral-bevel gearing. The other was the industry's first long-stroke slush pump, developed by Wilson-Snyder Manufacturing Corp., a direct-acting duplex steam pump having a direct-flow fluid end of one-piece, open-type construction. Then in 1930, the "Oilwell" No. 20 steam pump, the first 20-in.-stroke slush pump, came into wide use and helped set a succession of new drilling records in the then flush Oklahoma City field.

It was at Oklahoma City also that Oil Well Supply pioneered in the use of high-pressure steam in drilling, introducing the first oil-field boiler rated for 350-psi. working pressure. Hundreds of steam rigs in the field were converted to high-pressure steam at that time, and within the next few years Oil Well Supply pioneered in numerous developments aimed toward increasing the efficiency of steam rigs.

1927

The first high-tensile-strength large-diameter natural-gas-transmission pipe line is placed in operation for Dixie Gulf Gas Co. in Louisiana. The line comprises 16, 18, and 22-in. pipe and extends for a distance of 262 miles.

1929

Pure Oil Co. organizes the first major unitization project in the United States. Van pool in the East Texas basin, productive from the Woodbine sand, is placed under unit operation.

1930

C. M. (Dad) Joiner, Dallas wildcatter, discovers the gigantic East Texas oil field near Henderson. It uncovers a 5-billion-barrel high-gravity-oil reserve from the Woodbine formation of Cretaceous age, and marks the largest reserve of the decade.

IMPERIAL WORKS... Largest set of manufacturing plants of "Oilwell" is this assembly of factories at Oil City, Pa. The various plants have been continuously expanded over many years.

Power rigs were offering no competition at that time, and steam drilling was supreme and unchallenged.

Foreign Distribution Expanded

The search for oil was world wide, and in addition to opening many more stores in active areas in the United States, Oil Well Supply expanded its foreign distribution. Its representatives covered the oil fields of Colombia, Venezuela, Trinidad, Argentina, Ecuador, and Peru, and the pioneer drilling operations in Brazil were done with "Oilwell" equipment. In 1925, the company made an arrangement with an American distributor of machinery in Europe, Ralph E. Fair, to handle its line in Romania, and through this agency "Oilwell" equipment was used to a very large extent in the development of the famous Ploesti field.

From the time it had first opened for business in Pittsburgh, Oil Well Supply's offices on Water Street had been a rendevous for oil men from all over the world, a sort of international oil club and headquarters for roving wildcatters and drillers. There are still old timers among oil men who have a nostalgic feeling when "Water Street" is mentioned. But the business had outgrown its original quarters and business necessity outweighed sentiment, so in 1928 the firm's headquarters were moved to the Clark Building in downtown Pittsburgh.

Louis Brown resigned as president in 1928 and was succeeded by Walter Carrol, who served a little over one year. There were several mergers and sales, by which Oil Well Supply both acquired new lines of supplies and gave up other lines which it had distributed for many years. In May 1929, Oil Well Supply acquired Wilson-Snyder Manufacturing Corp. of Pittsburgh, and B. F. Harris, who had been president of Wilson-Snyder, became the fourth president of Oil Well Supply Co. In addition to bringing a capable man to its head, this gave the company the Wilson-Snyder line of slush, refinery, and other pumps and equipment which had enjoyed an outstanding reputation in the oil industry since that firm's founding in 1874.

A further organization change came in 1930 when Oil Well Supply became a subsidiary of United States Steel Corp. This gave it the financial and managerial support of "Big Steel," and it also returned to it the franchise to distribute the oil-country tubular goods manufactured by National Tube Co., which was also a subsidiary of U. S. Steel. Oil Well Supply had distributed National Tube products from the beginning except for 2 years during its hectic reorganizations, when the connection was lost.

The depression years were not notable for rapid advances in oil production nor in equipment innovations, but nevertheless considerable progress was recorded during the early 1930's.

1930

Five middle-western oil companies organize Great Lakes Pipe Line Co., a cooperative products pipe line extending from Oklahoma and Kansas refineries to Des Moines, Chicago, and Minneapolis markets.

1935

President Franklin D. Roosevelt transmits to the Seventy-fourth Congress a copy of "The Interstate Compact to Conserve Oil and Gas." After the President signs the compact, six middle-western states organize the Interstate Oil Compact Commission.

1937

Oil is struck at Burgan, 30 miles south of Kuwait, at a depth of 3,692 ft. in a Middle Cretaceous sandstone. Burgan field proves to be one of the largest single oil fields in the world. Proven reserves exceed 11 billion barrels.

WILSON-SNYDER ... Aerial view of the pump-manufacturing facilities of Wilson-Snyder, at Pittsburgh.

It was in 1930 that Oil Well Supply introduced to the trade the first string of fully heat-treated sucker rods, the result of 3 years of engineering and metallurgical research. Subsequently, the company designed and constructed the first complete sucker-rod furnace with quenching, drawing, and straightening equipment. The use of heat-treated rods was as much of an innovation in pumping equipment as was Oil Well Supply's earlier introduction of all-steel rods.

Skid-Mounted Pumping Units

The following year Oil Well Supply brought out its first self-contained, skid-mounted pumping units. These had the same basic construction features as those now in general use. Many of the early units were of single-crank construction and were provided with back cranks and hooked up with pumping pendulums and other devices for multiple-well pumping in the burgeoning East Texas field.

It was during this period that Oil Well Supply introduced a compact rotary assembly mounted an a portable steel skid base and including a geared transmission and flexible coupling. The principal feature of this unit was a separate engine, mounted on the skid, to operate the rotary independently, instead of using the heavy-duty draw-works prime mover for this relatively light service.

One of the special advances in drilling during this period was the introduction of the "Oilwell"-Brantly rotary feed control, manufactured under exclusive license from the inventor, J. E. Brantly. By substituting automatic weight control for the human factor of the driller's manual control, this devise permits uniform feeding and maintains the desired weight on the drill bit at all times, thus permitting faster and particularly straighter drilling.

Further progress in metallurgy at this time resulted in the perfection of a particularly abrasion-resistant alloy which "Oilwell" incorporated into its "DI-HARD" slush-pump liners and also into subsurface pumps and other equipment subject to frequent replacement due to severe abrasion.

Offshore drilling started, in a small way, during the early '30's, and "Oilwell" equipment first "went to sea" in 1931 when one of its customers, Ed Laguerre, of Delcambre, La., assembled a complete drilling rig on a steel barge. This is believed to be the first sea-going drilling rig ever designed for the purpose.

By this time it was obvious that the center of the oil industry was no longer in the Appalachian region but in the great Southwest. In 1932, Oil Well Supply moved its general offices lock, stock, and barrel, from Pittsburgh to Dallas. Its manufacturing plants, however, were

1938

Superior Oil Co. and Pure Oil Co. complete the first producing oil wells in the open waters of the Gulf of Mexico. The discovery is on the Creole prospect in waters 13 ft. deep at a point southeast of Cameron, La.

1938

The first installation of the Houdry catalytic cracking process is installed at Paulsboro, N. J., refinery of Socony-Vacuum Oil Co. This marks a forward step in refining technology in that it brought about the production of high-octane gasolines from low-grade stocks.

1940

First application of the hydroforming process is placed in operation in the Southwest. The process employs an aluminum - molybdenum catalyst in a fixed-bed arrangement; hydrogen gas produced in the process is recirculated.

NEILSEN PUMP DIVISION . . . Neilsen type "Oilwell" bottom-hole pumps are manufactured in this plant at Long Beach, Calif.

not moved, and the main factory at Oil City continued to expand and still produces the largest volume of the company's own equipment.

The great overproduction of crude oil during the depression and the increasing importance of petroleum in our economy brought about the need for conservation of these vital resources. Consequently, most oil states set up regulatory bodies to lay down sound conservation policies and see that they were carried out. The oil industry endorsed these programs and turned its attention to the avoidance of waste in production, to better utilization of reservoir gas, and to water flooding and other secondary-recovery measures.

Oil Well Supply assisted in this development in a number of ways. Its pumps, compressors, and engines had been used on some of the earliest secondary-recovery projects, but in the mid-'30's it brought out a portable repressuring test unit with all necessary equipment mounted on a skid base. This provided a temporary and low-cost means for testing several wells on a lease to determine what results could be anticipated from a permanent gas or air repressuring installation and what operating pressures and volumes would be required for maximum efficient recovery. This soon led to the development of the "Oilwell" package-type gas-booster units, having wide use in many types of service.

The storm clouds being generated by Hitler, Tojo & Co., during the late '30's failed to put a damper on the oil industry, for this was a period of rapid expansion and fast developments in technology. Oil Well Supply, now reaping the benefits of its association with the engineering research of U. S. Steel, made many innovations in its varied line of equipment.

This was the period when the internal-combustion engine was making big inroads into the domain of steam as the prime mover for drilling rigs. Opinion was strongly divided among drillers as to the merits of steam or power rigs, and Oil Well Supply, which had had much to do with the application of steam to drilling, stood by its first love for some time.

One of the important contributions made by Oil Well Supply during this period was its research in adaptation of torque converters to oil field machinery. As a result of this research the company in 1939 was the first to adapt hydraulic torque converters for oil-field use. Hooked up with an internal-combustion engine the torque converter transmits power with smoothness and flexibility giving the drilling rig operating characteristics approaching those of a steam rig.

The bombs that hit Pearl Harbor on December 7, 1941, put Oil Well Supply into the munitions business, along with most of American industry. Its plants continued to produce such oil-industry equipment as Government allocation orders specified, but primary attention was given to war contracts. "Oilwell" plants furnished shells, gun barrels, breech mechanisms, generator sets, and pumps and compressors for ships. Proudly the plants flew their pennants bearing the Army-Navy "E" and the Maritime Commission "M" for filling their production quotas speedily and efficiently.

1941

Three major petrochemical plants are placed in operation to found the present gigantic petrochemical industry along coastal Texas and Louisiana. These are Carbide & Carbon Chemicals plant at Texas City, Shell Chemical Co. at Houston, and Dow Chemical Co. at Freeport, Tex.

1942

The first fluid catalytic cracking process installation is placed in operation by Standard Oil Co. of Louisiana at its Baton Rouge plant. The process was adopted by most of the major refiners during World War II in production of aviation fuels.

1943

Magnolia Petroleum Co. places in operation the first T.C.C. unit at its Beaumont plant. This process proved highly effective in the manufacture of aviation gasoline.

WITTE ENGINE WORKS... This plant, at Kansas City, Mo., is entirely engaged in the manufacture of internal-combustion engines—gas, gasoline, kerosine, and diesel.

In the middle of the war, on February 28, 1943, B. R. Harris resigned as president of Oil Well Supply. He was succeeded by Fred F. Murray, who at 46 became the fifth president, and the first to maintain his office in the Great Southwest. He is a graduate mechanical engineer and has been in the business since 1929. Murray is the present president, and the fact that the enterprise has had only five presidents in its 90 years illustrates the stability and job tenure characteristics of the company.

When the tide of victory began to turn toward the Allies in 1944, American industry began to give thought to reconversion to normal activities. Oil Well Supply was then able to do some planning to meet the huge pent-up demand for oil equipment which it knew would come when the last gun was fired.

That year Oil Well Supply acquired Witte Engine Works of Kansas City, which had been making engines of various kinds continuously since 1870. As soon as war contracts began to taper off it converted part of the Witte facilities to making a line of gas-gasoline engines for oil-field pumping use. The following year Oil Well Supply expanded again by acquiring Neilsen Pump Co. of Long Beach, Calif., manufacturer of a highly developed line of bottom-hole pumps.

About the same time the pressure of war production began to let up sufficiently to permit some of Oil Well Supply's design and devolopment engineers to give thought to new and improved oil equipment. As a result, almost immediately after V-J Day, the company was able to bring out two new pieces of equipment of advanced design and performance. The first was a triplex horizontal power plunger pump expressly designed for water-flooding work. The other was the well-known No. 96 rig, with high capacity for deep drilling and which set new standards in operating convenience and flexibility through remote, air-powered manipulation of the controls.

With the war over, the oil industry engaged in an unprecedented drilling and expansion program, and Oil Well Supply launched into a general enlargement of its manufacturing and distributing facilities, opening new stores and warehouses, and adding to several of its plants. For example, during the immediate postwar years the company divided its old Midwest Division into four new divisions, each with its own headquarters — Gulf Coast at Houston, Central Midwest at Dallas, Mid-Continent at Tulsa, and Rocky Mountain at Casper—enlarged its Eastern Division headquarters at Columbus, and opened a new refinery warehouse at Ponca City, Okla.

The postwar trend in drilling equipment has been strongly toward portability, automatic controls, and heavy-duty equipment for deep drilling and high pressures, and Oil Well Supply has been in the forefront of all these developments.

Right after the end of the war Oil Well Supply began making its own portable derricks, and in 1946 it had a new and advanced design, the 128-B, seamless tubular-steel construction, so designed that the sections could be assembled on the ground and literally "walked up" to operating position. The first "Oilwell"-Witte gas engines for pumping units were also brought out immediately after the war.

Similarly, the last few years have seen rapid and continuous improvement in the rig controls, slush pumps, well pumps, compressor units, and

1943

Tennessee Gas Transmission Co. commences construction of its original natural-gas pipe line from South Texas to West Virginia. This single 24-in. line was completed as a part of the war effort in a record-breaking 11-month period.

1947

Imperial Oil, Ltd., discovers Leduc-Woodbend field 7 miles west of Edmonton, Alta., Canada. The discovery opens a reserve in excess of 200 million barreis of high-grade paraffin-base crude oil. Imperial opens the nearby Redwater field, a larger reserve, the following year.

1948

Oil is discovered in Scurry County, West Texas, initiating the most spectacular drilling campaign since East Texas. Major fields opened along the trend include Kelly-Snyder, Sharon Ridge, and Diamond M.

NEW LOOK . . . This new store was recently built at Kilgore, Tex., to replace one which had served this East Texas field for many years.

virtually all other types of equipment handled by Oil Well Supply. And there is no end in sight to this constant change and improvement, for the nation's rapid technological advance in metallurgy and other fields, combined with the oil industry's constant push for more efficient equipment, allows no letdown in the important business of designing and supplying new and better equipment.

Lest a reading of this chronicle suggest that Oil Well Supply has had the field to itself, it should be pointed out that the company has had plenty of competition all during its 90 years of life. In this country no concern can corner the brains and initiative in any field, and Oil Well Supply is no exception. Many a time it has been jarred back on its heels by the realization that some competitor was introducing an advanced piece of equipment which was finding wide acceptance in the oil industry, but just as often Oil Well Supply engineers were able to meet such a situation by bringing out something new and improved of their own design.

It has been nip and tuck all the way, but that, say Oil Well Supply executives, is what makes life interesting. Certainly it is typical of the oil industry. And the fact that the firm has grown steadily for 90 years and at all times during its history has maintained its position as one of the largest and most progressive supply firms in the industry shows that it has had at least its share of ingenuity and enterprise all along.

The drilling and producing branches of the oil industry always have been Oil Well Supply's specialty, although from the first many of its pumps, compressors, valves, fittings, and other equipment have been used in refineries, natural-gasoline plants, and pipe lines. This part of the business has expanded somewhat since the war, particularly through the development of several improved models of pumps. Impetus to this movement was gained in 1951 when National Transit Pump & Machine Co., of Oil City, Pa., went out of business and Oil Well Supply acquired the right to National Transit's popular line of centrifugal process pumps.

Today, at the age of 90, John Eaton's modest little business started at Oil City is the Oil Well Supply Division of United States Steel Co., with five plants and 3,500 employes. It has more than 100 stores and sales offices in 26 states, plus several warehouses and modification and service shops, which handle between 50,000 and 60,000 different items used by the oil industry, ranging from nuts and bolts to complete drilling rigs. Through its Canadian stores, its British subsidiary, its representatives in South America, and its New York export office, equipment bearing the "Oilwell" trade mark reaches oil operators in every part of the free world.

Ninety years is a long time for any business enterprise to exist, and it is doubtful if any oil company can trace its origin back as far as Oil Well Supply can. As a matter of fact, back when John Eaton started the business there was nobody so rash as to suppose that the oil industry itself would last 90 years. Every few years since then somebody has woefully predicted that we are running out of oil and no more fields will be discovered. The fact that the drillers keep right on finding new fields is due to the resourcefulness and initiative of the oil industry, always aided and supplied by bigger and better equipment devised and produced by such firms as Oil Well Supply.

1949

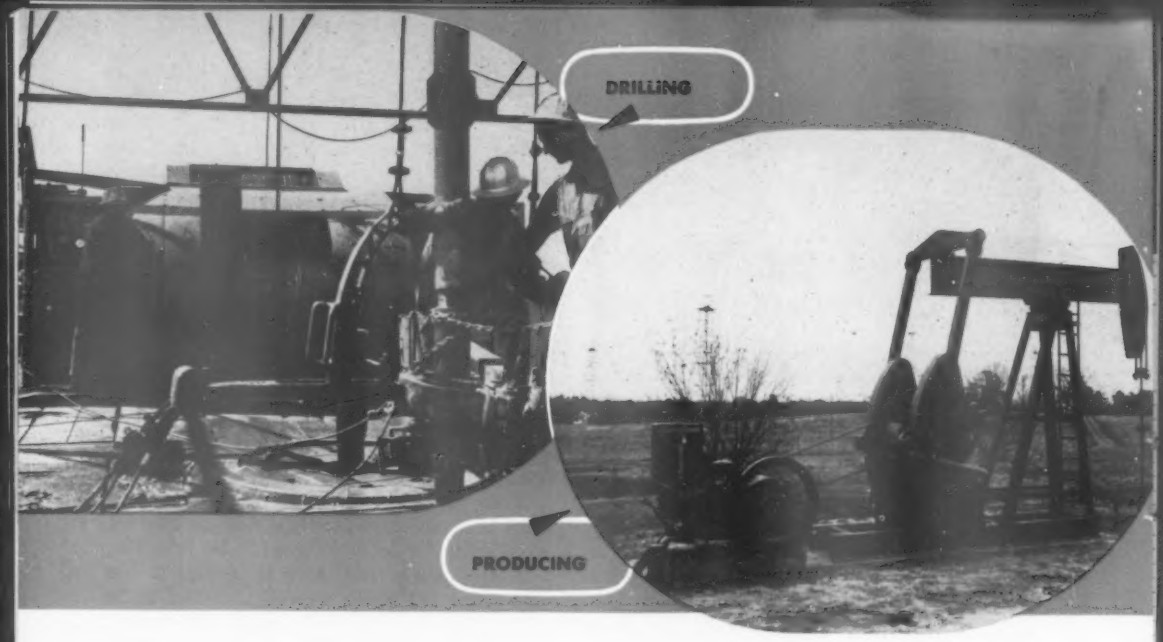
Union Producing Co. discovers the first important oil field in Mississippi at Tinsley, Yazoo County. This 180-million-barrel reserve proved to be the greatest of a series of fields opened subsequently throughout the Eastern Gulf region.

1951

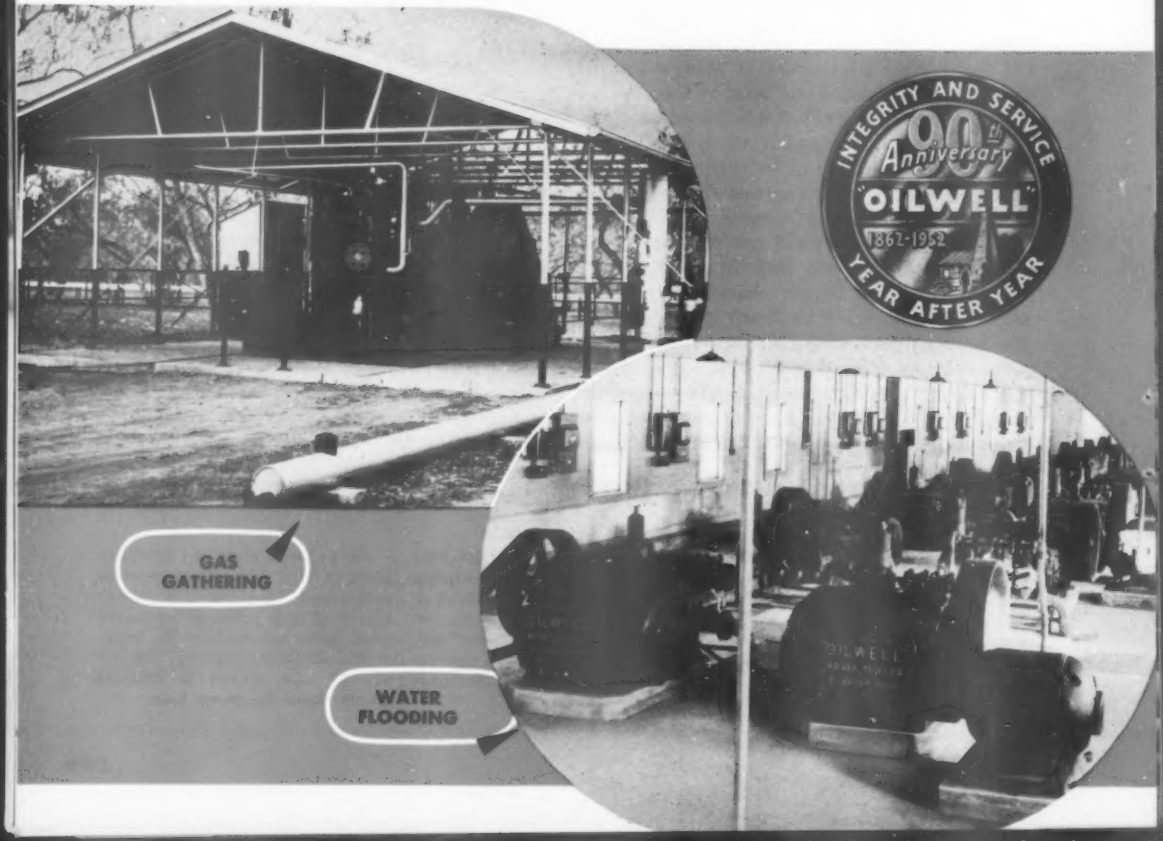
Amerada Petroleum Corp. discovers oil near Tioga, N. D., in the heart of the Williston basin. Prolific production is found in dolomites of Mississippian and Devonian age, opened a vast leasing and exploration campaign straddling the International Boundary.

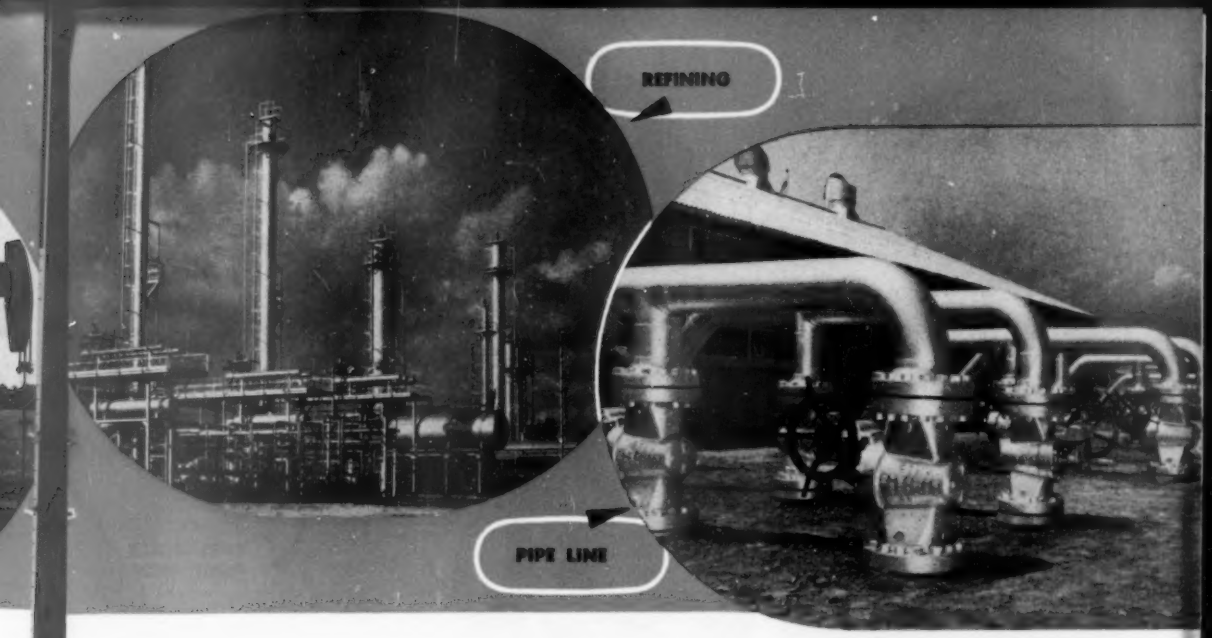
1952

Development along the Spraberry trend in West Texas reaches major proportions. More than a million barrels of oil is produced per month from wells completed in the Pennsylvanian. During January, 108 out of 127 wells drilled in Midland County were Spraberry tests.



Your Partner





in Progress for 90 Years

THE DRAKE WELL, 1859, marked the beginning of the Petroleum Industry.

Today's leaders in this Industry all began as small enterprises and have grown up with the times.

Each was founded on an *idea.*

Those that survived have followed an *ideal.*

"Oilwell" is such an organization.

The *idea* was formulated and applied by Mr. John Eaton and his associates back in 1862 when they founded a company which devoted itself exclusively to supplying the industry that was developing so rapidly around the Drake Well.

The *ideal* was to support this new and expanding industry with unstinted cooperation, far transcending the usual relationships which exist between seller and buyer.

The present-day "Oilwell" organization has never deviated from that *ideal* . . . participating in the Industry's problems, designing special equipment to meet the Industry's specific requirements, expanding service facilities and maintaining diversified stocks at strategic field locations to facilitate the growth and progress of the Industry's specialized branches.

OIL WELL SUPPLY
DIVISION
UNITED STATES STEEL COMPANY

Executive Office—DALLAS, TEXAS
Export Office—
30 ROCKEFELLER PLAZA
NEW YORK 20, N. Y.

Area Offices — CALGARY, CANADA
CASPER, WYOMING . . . COLUMBUS, O.
DALLAS, TEXAS . . . HOUSTON, TEXAS
TULSA, OKLA. . . . LOS ANGELES, CALIF.

Branches Serving All Oil Fields

USS TRADE MARK

"OILWELL" TRADE MARK

UNITED STATES STEEL

SUBSURFACE PUMP SHOP

BRANCH STORE

Wherever there's OIL . . .

DISTRICT WAREHOUSE

MODIFICATION CENTER, GARLAND, TEXAS

there's "OILWELL"

Finding Oil Is One Thing!

Producing, transporting and processing it after it is found, is something else!

But seeing that adequate stocks of equipment, tools and maintenance supplies are first available in the "Boom-Towns," then throughout the producing years which follow, has been "Oilwell's" service to the industry since its very beginning.

Efficiency-minded operators large and small, save both time and money by centralizing their purchasing arrangements through "Oilwell"—enabling field crews to get whatever they need without delay at the nearest "Oilwell" Store or Warehouse.

Discover for Yourself . . . the many advantages of shifting your procurement responsibilities to a long-established, fully-integrated manufacturing and distributing organization that specializes in supplies for the Petroleum Industry. You are invited to bring your problems to "Oilwell."

OIL WELL SUPPLY
DIVISION
UNITED STATES STEEL COMPANY

Executive Office—DALLAS, TEXAS
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30 ROCKEFELLER PLAZA
NEW YORK 20, N. Y.

Area Offices—CALGARY, CANADA
CASPER, WYOMING . . . COLUMBUS, O.
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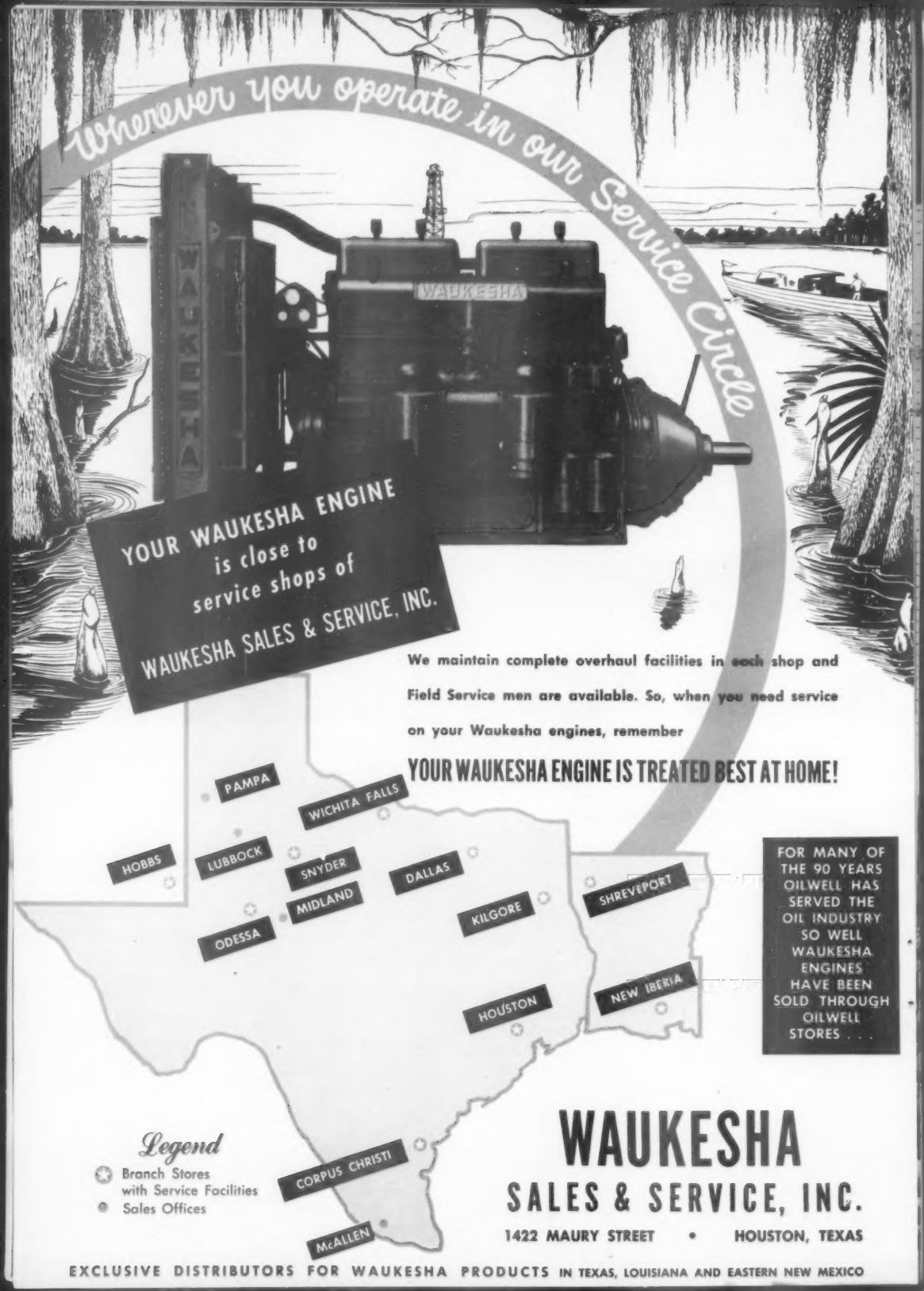
Branches Serving All Oil Fields

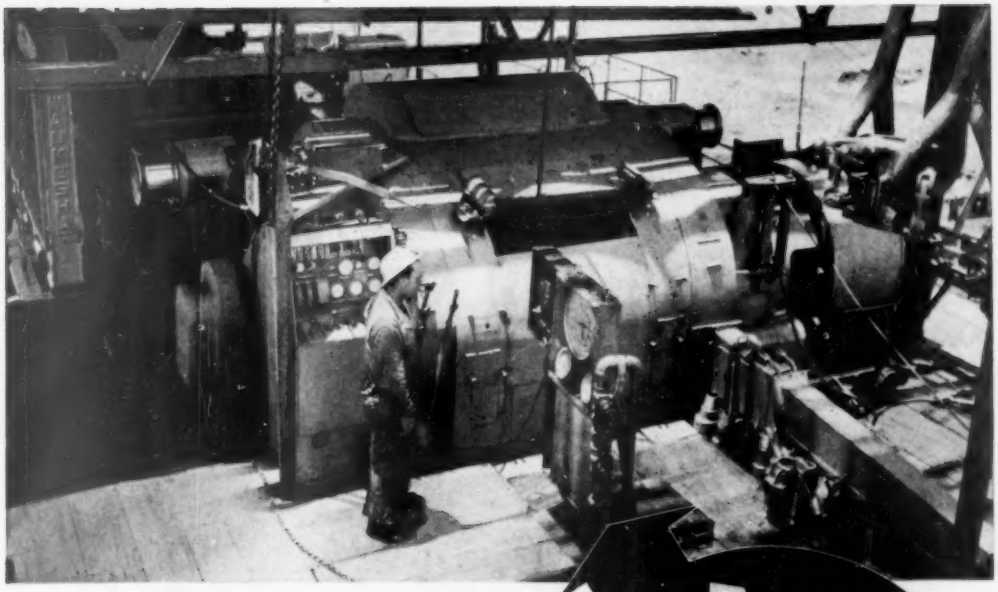
USS

"OILWELL"

TRADE MARK

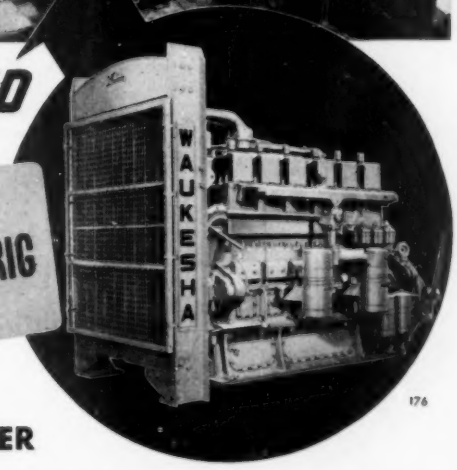
UNITED STATES STEEL


Wherever you operate in our Service Circle
WAUKESHA
YOUR WAUKESHA ENGINE
is close to
service shops of
WAUKESHA SALES & SERVICE, INC.
We maintain complete overhaul facilities in each shop and Field Service men are available. So, when you need service on your Waukesha engines, remember
YOUR WAUKESHA ENGINE IS TREATED BEST AT HOME!
PAMPA
WICHITA FALLS
HOBBS
LUBBOCK
SNYDER
DALLAS
MIDLAND
SHREVEPORT
KILGORE
ODESSA
HOUSTON
NEW IBERIA
CORPUS CHRISTI
McALLEN
FOR MANY OF THE 90 YEARS OILWELL HAS SERVED THE OIL INDUSTRY SO WELL WAUKESHA ENGINES HAVE BEEN SOLD THROUGH OILWELL STORES . . .
Legend
Branch Stores with Service Facilities
Sales Offices
WAUKESHA
SALES & SERVICE, INC.
1422 MAURY STREET • HOUSTON, TEXAS
EXCLUSIVE DISTRIBUTORS FOR WAUKESHA PRODUCTS IN TEXAS, LOUISIANA AND EASTERN NEW MEXICO



RECORD drilling SPEED in West Texas...

WITH AN "OILWELL" RIG



176

and WAUKESHA POWER

● Another record! But that's nothing new—for a combination "old" in oil field accomplishment. With their more than twenty-five years of alert teamwork *"Oilwell"* and *Waukesha* are constantly making and breaking records in the oil fields.

Drilling more than 260 feet per day—a Waukesha-powered triple engine drive *Oilwell* No. 96 Rig set a new record for the first 10,024 feet—38 days, 3 hours—almost 40% better than the average for the Benedum field in the West Texas area.

This "Oilwell" Rig has three Model 6-LRO Waukesha Power Units—six cylinders, 8½-in. bore x 8½-in. stroke, 2894 cu. in. displacement—each over 400 peak hp at 1050 rpm, or 300-375 hp continuously at 900 rpm on natural gas or butane. Two mud pumps were used, an 8 x 20 and a 7¾ x 18 standby. Rig also has a Brantly hydraulic feed control; and a dynamatic brake.

Waukesha Engines and Power units—for every oil field service—operate on Diesel fuels, natural gas, butane or gasoline; range from 10 hp to over 500 hp. Send for Bulletin 1079.

WAUKESHA MOTOR COMPANY • WAUKESHA, WIS.

NEW YORK • TULSA • LOS ANGELES

WAUKESHA Oil Field POWER

Congratulations to

Oil Well Supply Company

FOR 90 YEARS OF SERVICE TO THE OIL INDUSTRY 1862 - 1952

FROM the wood-derrick, cable-tool days of Kansas, Oklahoma, Wyoming to Spraberry, OILWELL has always been near the scene of discoveries, ready and able to serve. OILWELL is as much a part of the oil scene as the Rock Hound, the Wildcatter, the Roughneck, the Roustabout, and it has often served far beyond its job as a Supply Organization to make even more important its contributions to the oil industry.

We at Link-Belt take off our hats to the Oil Well Supply Company for its 90 years of outstanding service.

LINK-BELT COMPANY

12,000

who says there's no "sure thing" in oil drilling?

Neither Oil Well Supply nor Thermoid can guarantee a producer, but together, they offer one "sure thing" . . . Oil Field Products that set the standard of performance . . . giving long, dependable wear under the toughest conditions.

For 90 years, Oil Well Supply has provided the petroleum industry with dependable products and equipment. Important among them are Thermoid Oil Field products such as the cost-cutting combination shown below: Thermoid Multi-V Belts . . . Rotary Hose . . . Mud-Flow Suction Hose . . . Flexible Discharge Units.

Thermoid is proud of its association with Oil Well Supply—an association which dates back to 1932, and congratulates them on 90 years of continuous service devoted exclusively to the petroleum industry.

IT'S FROM "Oilwell"

SEE OUR CATALOG IN THE COMPOSITE CATALOG

Mid-continent Offices and Warehouse: Houston, Texas

Thermoid

Powerflex Rotary Hose • Trioflex Slim-Hole Rotary Hose • Mud-Flo Slush Pump Hose • Flexible Discharge Units • F.H.P. and Multiple V-Belts • Oil Country Flat Belting

Wire Line Turn Backs • No-Wip Line Savers • Stuffing Box Rings • All Types of Hose • Molded Specialties • Brake Blocks

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CATAWISSA
DOUBLE UNION SWING CHECK VALVE "502"

FULL OPENING FOR 100% UNOBSTRUCTED FLOW!

COMPACT!
EFFICIENT!
ECONOMICAL!
EASILY ACCESSIBLE!

flow line and pipe line type for general oil country use in either horizontal or vertical position!

CATAWISSA Double Union Swing Check Valves are designed and recommended for the rough and ready demands of oil country applications in lines where no stop is installed close to the check valve and where pipe cleaning mechanisms (go-devils) are used. They are FULL OPENING, furnished with Catawissa PERFECT SEAL Unions on both ends to permit breaking the line at inlet end, with check holding line contents. Union connection on both ends eliminates the use of a full union and nipple necessary to install regular type check valves.

REFAX METAL BODIES
HITENSILOY WORKING PARTS
★
500-lbs. SERVICE O.W.G.
1500-lbs. TEST
250-psi WSP
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SIZES 2" to 4"

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CONGRATULATIONS to

OIL WELL SUPPLY CO.

on their 90th ANNIVERSARY!

WRITE FOR FREE CATALOG 11 SHOWING THE COMPLETE CATAWISSA LINE

CATAWISSA VALVE & FITTINGS COMPANY
400 MILL STREET ★ CATAWISSA, PENNA.

Our

Sincerest

Congratulations

to

Oil Well Supply

Co.

on

their

90th

Anniversary

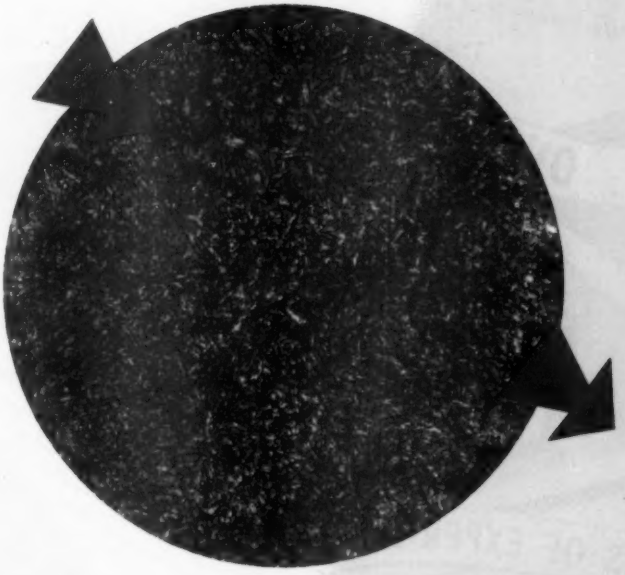
I. H. GRANCELL
1601 EAST NADEAU STREET
LOS ANGELES 21, CALIFORNIA

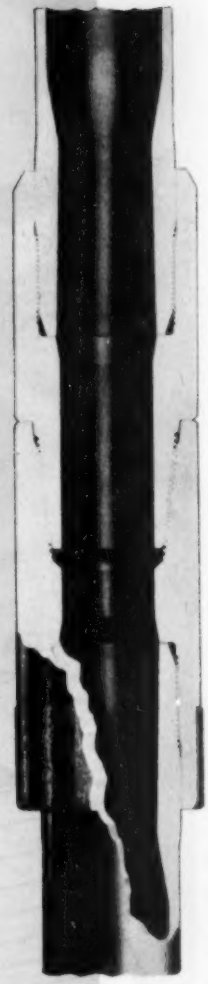
Manufacturers of 'BESTOLIFE Tool Joint and Casing Compound

Here's another reason why

REED TOOL JOINTS

last longer!





This photomicrograph of a steel specimen from a **REED** Tool Joint means little to most people—but an internationally famous steel company said, "It is one of the most perfectly heat treated . . . one of the most homogeneously tempered martensitic structures . . ." they had ever seen.

In plain English, that simply means that the **REED** Tool Joint is exceptionally strong and tough.

The steel in your **REED** Tool Joints is just like that, because **REED** "tailors" precision heat treating to each heat of steel instead of using a standard heat treatment based on average analysis.

This "tailored" heat treatment makes **REED** Tool Joints even stronger and more wear resistant. It is another important reason why **REED** TOOL JOINTS LAST LONGER!

REED ROLLER BIT COMPANY

HOUSTON 1, TEXAS

NEW YORK LONDON BUENOS AIRES

Gulf Coast, Mid-Continent, Rocky Mountain and Canadian Distributor for Martin-Decker Products

CONGRATULATIONS

OIL WELL SUPPLY
DIVISION
UNITED STATES STEEL COMPANY
Manufacturers and Distributors of Oil Field Equipment
DALLAS 1, TEXAS

ON 90 YEARS OF PROGRESS

M I F

88 YEARS OF EXPERIENCE
IN MALLEABLE FITTINGS

Malleable Fittings
Standard ⅛" through 6"
Heavy Oil (300 lbs.) ¼" through 4"

Branford Ground Joint Unions
300 lbs. ¼" through 4"
250 lbs. ¼" through 3"
150 lbs. ¼" through 3"

MALLEABLE IRON FITTINGS CO.
BRANFORD, CONNECTICUT

Pickering governor, Air Maze oil-bath cleaner, McCord lubricator and Lorain gasoline starter standard; Twin Disc clutch optional.

Two famous names—Oilwell and Lorain—combine to bring you a line of rugged oil field engines ranging from 10.7 to 55 HP.

Latest model, and largest in the line, is this husky Lorain Model DA cold-starting full diesel which can be converted in the field to gas operation. Radiator type system assures adequate cooling under all loads. The Lorain Model DA features tapered roller bearings for crankshaft and auxiliary shafts. A wet sleeve cylinder of alloy cast iron assures long life and easy replacement with minimum downtime.

For dependable, low-cost power rely on Lorain Engines. Ask your Oilwell representative for full details or write for literature. A-5613

CONDENSED SPECIFICATIONS

Lorain Engine	Type L	Type O	Type R	Type A	Type DA
Bore	7½"	9½"	12"	13"	13"
Stroke	8"	10"	13"	13"	13"
Speed Range RPM	300—600	240—450	185—300	185—325	185—325
Rated Horsepower	10.7—21.4	17.2—32	27—40	32—55	32—55
Overall Height	53"	59"	68"	68"	60"
Overall Length	72"	88"	110"	110"	117"
Overall Width	48"	58"	72"	74"	55"
Approx. Ship. Wt.	2600 lbs.	3800 lbs.	8000 lbs.	8200 lbs.	9050 lbs.

WHITE-ROTH LORAIN, OHIO

CHAIN REACTION

Just around the corner from your drilling location . . in every oil active area of the United States . . . a supply store is ready to serve you. No other division of any other American industry has such a large stock of supplies and skill at its beck and call.

Under the challenge of free competition, oil field supply stores have continually opened new locations and made new stocks available in new areas as the oil industry threaded its way back and forth across the country. They have often worked with manufacturers to design and improve drilling equipment that has resulted in more oil production. So, today, any need of the oil industry touches off a "chain reaction" of service that connects every area where the search for oil is extended.

We extend our congratulations to Oil Well Supply Company for their record of 90 years of dependable service to the oil industry.

MAGNET COVE BARIUM CORPORATION
ONE OF THE DRESSER INDUSTRIES
MALVERN ARKANSAS • HOUSTON, TEXAS

Magcobar
Complete
DRILLING MUD SERVICE
DEALER

Magcobar • Magcogel • High Yield • Magco-Fiber • Xact Clay • Fiber Seal • Leather-Floc • Form-A-Plug • Cell-O-Seal Salt Gel • Magco-Phos • Red Ox • Magco-Mica • Tannathin Jel-Oil Mud • Jel-Oil "E" • "E" Concentrate • Noheev My-Lo-Jel Preservative • Quebracho • Chemicals

HAPPY BIRTHDAY "OILWELL"

PROOF
of performance is in the
PACKING

For 90 years the OIL WELL SUPPLY name has meant dependable equipment for the multi-million-dollar oil industry—equipment designed and sold for the job it had to do to make drilling, producing and refining more efficient and productive.

Into this equipment goes time-tested materials and parts with proven performance records... standardized on because of the skillful engineering and production techniques which have made them best for the job requirement.

"OILWELL" has standardized on Universal materials for a number of years . . . and together we maintain continuous engineering research and testing to assure you dependable performance and continued service from oil equipment that you buy.

THESE UNIVERSAL PACKINGS ARE "OILWELL" STANDARD

STYLE X16A3R Precision-moulded duck and synthetic goose-neck gaskets for rotary swivels.

STYLE N-710 Non-crushable moulded duck and synthetic oil-resisting composition ring for all sizes of fluid piston rod packing.

STYLE 678 Die-formed plastic ring steam rod packing, for pressures to 500 lbs., temperatures to 850° F., and travel to 600′ per minute.

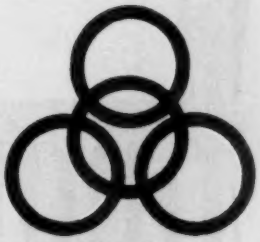
STYLE 770 Hot-moulded pump gaskets of hard oil-resisting synthetic impregnated duck for high or low pressure valve cap and fluid cylinder head.

Universal manufactures a complete line of metallic, plastic, rubber and fibrous packing and gaskets for all purposes. See our pages in the Composite Catalog.

UTEX

SOLD THROUGH YOUR LOCAL SUPPLY STORES

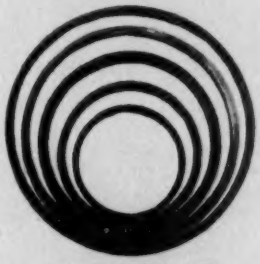
3525



Universal Style X16A3R Goose-Neck Gaskets

Universal Style N-710

Universal Style 678 Steam Rod Packing



Universal Style 770 Pump Gaskets

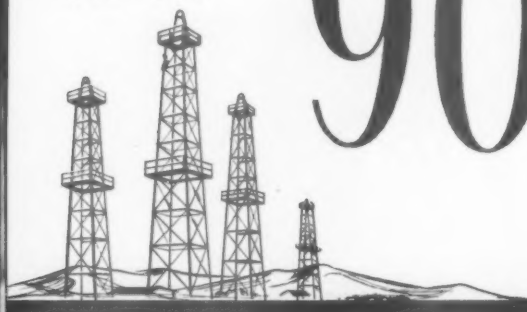
UNIVERSAL PACKING & GASKET COMPANY
5210 CLINTON DRIVE • PHONE ORchard 8321
HOUSTON 20, TEXAS

Congratulations

to

OIL WELL SUPPLY COMPANY

on its 90th *Anniversary*



May you enjoy many more years of continued success... A reward to your splendid organization for its outstanding service to the industry!

SHAFFER

HIGH PRESSURE DRILLING AND CONTROL EQUIPMENT • FISHING TOOLS THAT EXCEL

SHAFFER TOOL WORKS, Brea, California • California Service Shops: Santa Fe Springs and Taft
HOUSTON, TEXAS, 8096 Navigation Blvd. • ODESSA, TEXAS, 1925 West Second Street
OKLAHOMA CITY, OKLAHOMA, Acme Oil Tool Company, 1001 S. E. 29th Street
CASPER, WYOMING, Shaffer Tool Works, Post Office Box 1788
EXPORT SALES OFFICE, Shaffer Tool Works, 500 Fifth Avenue, New York, N. Y., U.S.A.

Superior Service

FOR 90 YEARS

"OILWELL"

For nearly a century, Oil Well Supply Division of United States Steel has continuously provided the oil industry with increasingly better equipment . . . equipment that has helped the industry progress into the multi-million-dollar business it is today.

McEvoy Company is proud to have been associated with "Oilwell" during many of our own 46 years in the industry, and congratulates you on your 90 years of superior service.

SUPERIOR SERVICE TOO... FROM McEvoy AUTOMATIC LUBRICATED CONDUIT GATE VALVES

The McEvoy Valve, the product of many years' design and engineering experience, incorporates many advanced features that help reduce the cost of producing oil.

The exclusive automatic lubrication system of the McEvoy Valve stops leaks the minute they start . . . eliminates the cause of most valve failures. Chrome-plated sealing surfaces minimize corrosion troubles . . . all-stainless *Macaloy* Valves available for severe corrosion conditions. McEvoy Valves are made in a complete line of sizes and pressure ratings for Christmas trees, flow lines and cycling plants. Nine years of field service have proved the McEvoy Valves to be the safest, longest-lasting and most economical valves available today.

Sold Through Your Local Supply Store

ONLY McEVOY CONDUIT GATE VALVES COMBINE ALL THESE FEATURES

1. Automatic Continuous Lubrication—Positively Stops Leaks the Instant They Start.
2. Self-Aligning Gates and Non-Distorting Seats Provide Perfect Fit and Tightness Under all Conditions.
3. Two-Way Valve Assures Perfect Lubrication Sealing with Pressure in Either Direction.
4. Provides a Perfect Lubricant Seal when Valve is Installed in any Position.
5. Gate Sealing Surfaces are in Continuous Wiping Contact with Seats at all Times.
6. Stem Packing and Bearings may be Safely Replaced under Full Line Pressure.

McEvoy COMPANY

Texas and Milby St. P. O. Box 3127
HOUSTON 1, TEXAS

EXPORT REPRESENTATIVE: E. F. GAHAN, INC.,
ROOM 1223, 500 FIFTH AVENUE, NEW YORK, N. Y.

3563

Every

O·C·T

PRODUCT

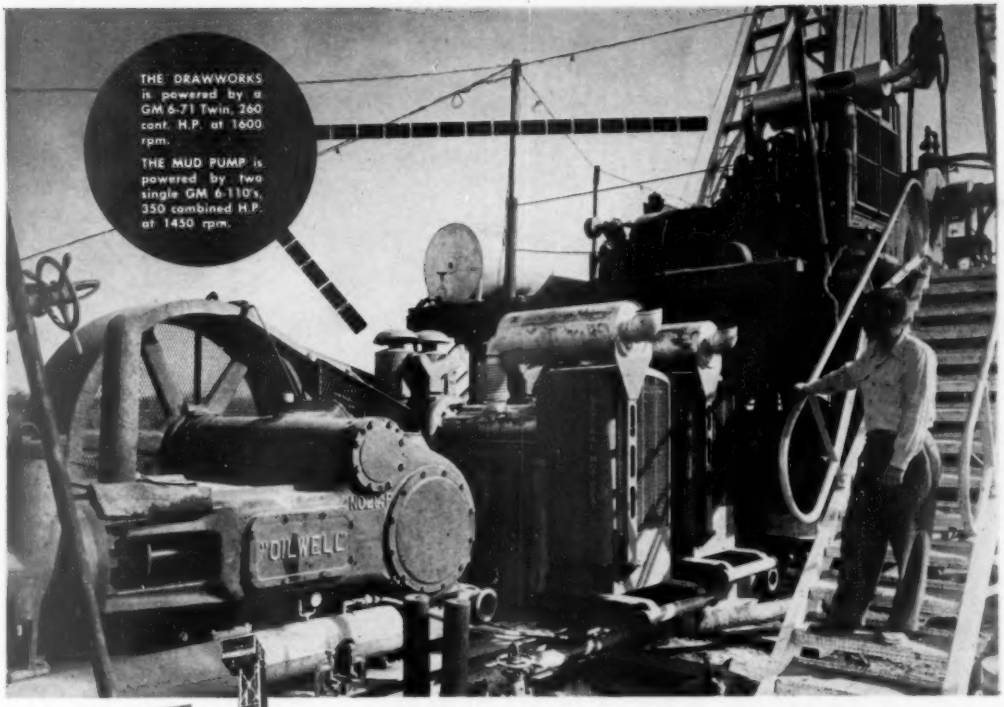
is available

THROUGH SUPPLY STORES

Oil Center Tool *Co.*

P. O. Box 3091 Houston, Texas

Export Representatives: Sterling Areas—Le Grand, Sutcliff & Gell, Ltd., Rochester, Kent, England. Address Export Inquiries for All Other Countries to P. O. Box 3091, Houston 1, Texas.


THE DRAWWORKS is powered by a GM 6-71 Twin, 260 cont. H.P. at 1600 rpm.
THE MUD PUMP is powered by two single GM 6-110's, 350 combined H.P. at 1450 rpm.
"OIL WELL"

Schimmel - Taylor is another of Texas' leading drilling contractors who have given their endorsement to GM Diesel Engines and Stewart & Stevenson Services. The application experience and "know how" of Stewart & Stevenson can be of benefit to you. Call today for the full story as it applies to your job. No cost or obligation.

"EXCELLENT SERVICE with GM's from STEWART & STEVENSON"

REPORTS SCHIMMEL-TAYLOR COMPANY

"We have been a user of GM Diesel Engines for a number of years. This in itself should disclose our feeling toward them as being adaptable and outstanding for oil field service. We received excellent service from your GM 6-71 Diesel Twins, being used both on draw works and pump drive. The two 6-110 Diesel Engines, which were applied to an OWS 214P pump last November, have given perfect service, and are doing an outstanding job with the pump. As you know, we have governed the engine back to approximately 1400 RPM and they are simply playing with the 214 pump at this RPM."

STEWART & STEVENSON SERVICES, Inc.

Main Office and Plant: 4516 Harrisburg Blvd., Houston 11, Texas. Phone WOodcrest 9691

Branches: Corpus Christi, Dallas, Lubbock, Wichita Falls, McAllen (San Juan), Odessa

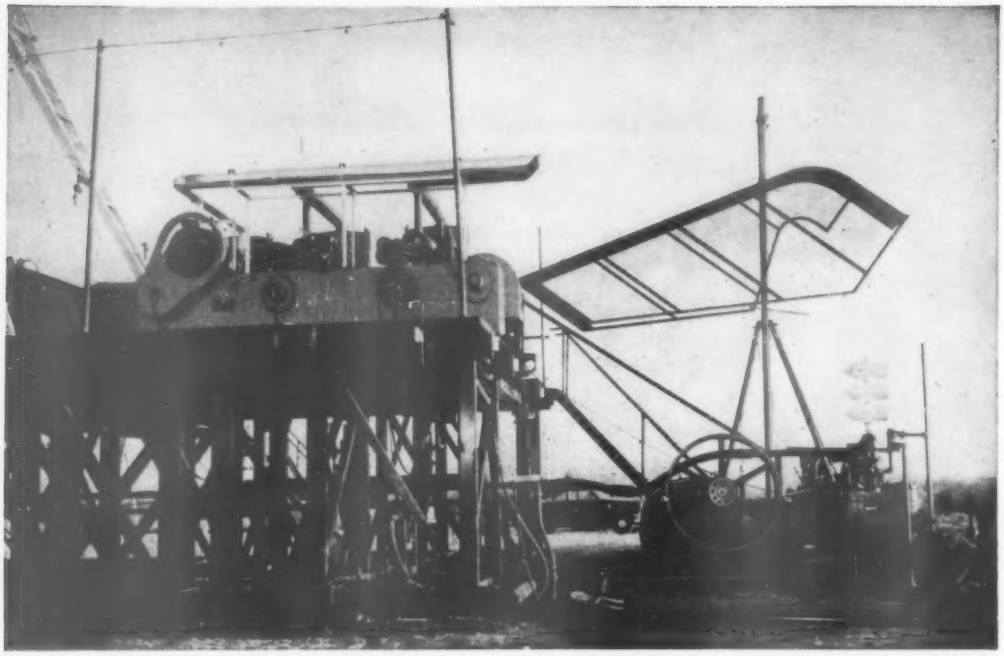
Representatives: San Antonio, Longview, Brownsville, Beaumont, Laredo, Port Arthur

Distributors of: General Motors Diesel Engines, Continental Red Seal Engines, Chrysler Industrial and Marine Engines, Chicago Pneumatic Engines, Petter Diesel Engines, Gardner-Denver Pumps.

Fabricators of: Engine Driven Electric Generator Sets, Portable Pumping Units, Truck Bodies, Oil Field Equipment.

PARTS... SERVICE — STEWART & STEVENSON SERVICES, INC. — Anytime Anywhere

THE NATION'S LARGEST DISTRIBUTORS OF GM DIESEL ENGINES



THIS OIL-WELL RIG was designed and built by Oil Well Supply Company, using Worthington QD sheaves.

CONGRATULATIONS –Oil Well Supply Company on your 90th birthday!

Ninety years on the job—but still right up-to-date when it comes to serving the industry with the most modern equipment!

This is Oil Well Supply Company. We at Worthington are proud to have you as one of our Multi-V-Drive distributors—and to supply the QD* sheaves and belts that go into the making of rigs like the one shown above.

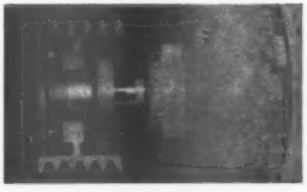
It was the demands of oil industry suppliers like you as well as those of oil production men everywhere that gave the Worthington QD sheave its start. Today, *all* industry uses it. In fact, it's the *most widely used* hub and rim combination in existence.

Oil Well Supply Company furnishes Worthington QD sheaves as standard equipment on all of their machinery items. Your miscellaneous sheave requirements will receive prompt service attention through all Oil Well Supply Company stores. They're all backed up by complete factory stocks of Worthington QD sheaves in Fort Worth, Tulsa, Houston, New Orleans and Los Angeles.

It'll pay you to standardize on the Worthington QD. Worthington Corporation, formerly Worthington Pump and Machinery Corporation, Multi-V-Drive Sales Division, Buffalo, N. Y.

*Reg. U.S. Pat. Off.

EASIER TO GET ON



EASIER TO GET OFF

YET ALWAYS TIGHT ON THE SHAFT

WORTHINGTON

Multi-V-Drives

MV.2.8A

CONGRATULATIONS..

OIL WELL SUPPLY COMPANY

on the anniversary of your 90th year of uninterrupted service to the great oil industry!

It has been a pleasure working with you over the years—since the very beginning of our own operations in 1921.

Integrity — Skill — Research
STANDARD OF QUALITY

there's a LubriKup

for every service and service with every LUBRIKUP!

NEW DESIGN
WOOD-TYPE VALVE CUPS

The only precision-made valve cup with a heavier side wall to give additional strength and longer wear!

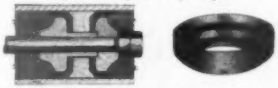
A new design with a 45° bottom provides more area for greater support at the heel, eliminating breakdown at the heel. Cups and spacers are precision made to fit each other without distortion on the cups.

REGULAR TYPE VALVE CUPS

Hard, medium, soft, special hard and special soft—the right type for any depth well or pumping condition!

JERKER-KUPS
a universal packing

standard equipment on many packed piston pumps



TYPE H Pressure Seal Piston & Cup

OTHER LubriKup PRODUCTS

SEATING CUPS AND RINGS
PRESSURE SEAL PISTONS
Hydraulic and Air Service
JACK CUPS

when you make a true cost comparison—

• SERVICE-WISE...

• PERFORMANCE-WISE...

actual oil field use has PROVEN this premium packing

Cheaper than all competitive packings

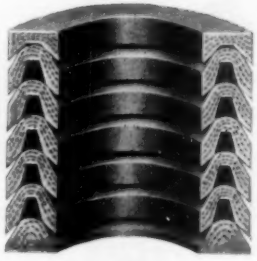
PERFECT FLUID-SEAL PREVENTS SLIPPAGE . . . REDUCES ROD WEAR TO A MINIMUM . . . AND PROVIDES NEW, LONGER ROD AND PACKING LIFE!

LubriKup

FLUID-SEAL ROD PACKING

New records of pump efficiency and economy are being experienced throughout the oil industry with LUBRIKUP FLUID-SEAL ROD PACKING!

Incorporating the proven theory of lip-type action (sealing from pressure), with space provided between each ring, LUBRIKUP FLUID-SEAL ROD PACKING assures a perfect, non-binding seal for lubrication of the rod. By providing such maximum protection at all times, rod wear due to friction is so greatly reduced that rod life has been extended to a previously unbelievable longer time! The flexible lip construction provides the equally welcomed economy of new, longer packing life!



FLUID-SEAL ROD PACKING NEEDS NO TIGHTENING

This premium packing must run loose (adjust finger-tight only). If run tight, it will give no better service than conventional short-life types of packing! Normal operating pressure will expand the lip to compensate for wear until the packing is completely worn out!

— AT YOUR FAVORITE SUPPLY STORE —

LUBRIKUP COMPANY, INC.
WILLIAMSPORT · PENNSYLVANIA

EXCLUSIVELY MANUFACTURING COMPOSITION CUPS FOR THE OIL INDUSTRY

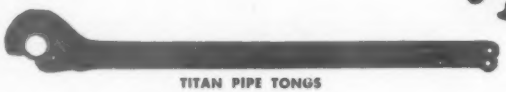
PETOL & TITAN
TONGS

"Most Complete Line of Tongs in the World"

PETOL STABBING TONGS

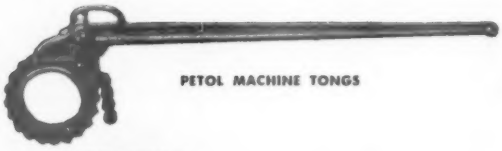
PETOL HEAVY DUTY TUBING TONGS

PETOL PIPE TONGS



TITAN PIPE TONGS

TITAN CHAIN TONGS

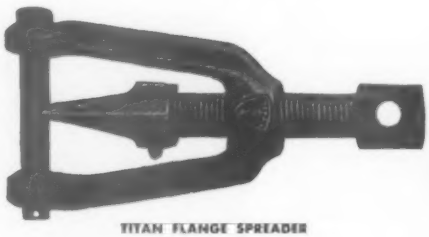


PETOL MACHINE TONGS

TITAN REVERSIBLE CHAIN TONGS

PETOL TUBING TONGS

PETOL FITTING TONGS



TITAN FLANGE SPREADER

PETOL BULL TONGS

PETOL FORKED SPINNING LINE

28 Types
A TYPE FOR EVERY PURPOSE
290 Sizes
A SIZE FOR EVERY REQUIREMENT

WRITE FOR CATALOG NO. 50

GEARENCH MFG. COMPANY
HOUSTON, TEXAS, U.S.A.
EXPORT OFFICE: 74 TRINITY PLACE, NEW YORK, N. Y.

CONGRATULATIONS, "OILWELL"

90 years is a long time . .

JUST A FEW YEARS short of a century ago . . . when Americans were just beginning to discover the vast, often hidden, resources of this country . . . two companies, geographically located far apart, had their beginnings.

One started in business as a supplier to the infant petroleum industry. The other started with a belief that there was a market for products made from the mineral asbestos. The men who founded these two organizations must have been good men, with ideas that were sound and true . . .

For both Oil Well Supply—started 90 years ago—and Johns-Manville—just 4 years old when "Oilwell" opened its doors for business—are leaders in their respective fields today.

As suppliers to "Oilwell" for many years, Johns-Manville extends its sincere congratulations—it has been a long, exciting and dramatic ninety years to grow and live through!

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville

INSULATIONS—PACKINGS AND GASKETS
"CLIPPER SEAL" OIL SEALS—
INDUSTRIAL FRICTION MATERIALS

TORTURE CHAMBER

for VALVE and FITTING MATERIALS

Here, steam up to 1500 pounds pressure and 1000° F. gives Vogt the answer to any question of materials or construction for valves and fittings in just a few days . . . facts that would take years to obtain under normal operating conditions!

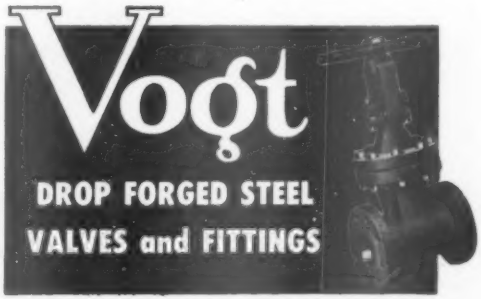
We set up our own Torture Chamber to determine the durability of valve packings and gaskets; the resistance of various steels to corrosion and erosion; and how hard and how smooth surfaces of seats, discs and stems must be to withstand steam at high pressures and high temperatures. We tested and found an ideal yoke nut material, and we uncovered facts on joint design that could be found in no other way.

Thus, by constant and accelerated testing, we quickly and definitely prove or disprove the claims that are made for many newly developed materials. And thereby we make sure that only the best goes into valves and fittings that bear the name Vogt.

Consult Catalog F-9 for the complete Vogt line of drop forged steel valves, fittings and flanges for steam, water, oil, gas, air and refrigeration services.

HENRY VOGT MACHINE CO., Louisville 10, Ky.

BRANCH OFFICES: NEW YORK • CHICAGO • CLEVELAND
PHILADELPHIA • ST. LOUIS • DALLAS • CHARLESTON, W. VA.



Congratulations

to

OIL WELL SUPPLY CO.

on its

90th Birthday

May this Dependable Organization Continue to Grow and Prosper in its Service to the Industry

---

1890 1940

Simplex

LEVER · SCREW · HYDRAULIC

Jacks

TEMPLETON, KENLY & COMPANY

1034 So. Central Avenue, Chicago 44, Illinois

CONGRATULATIONS TO THE OIL WELL SUPPLY COMPANY ON THEIR

90 YEARS

OF SERVICE TO THE OIL INDUSTRY . . . WE ARE PROUD TO BE ASSOCIATED WITH SUCH AN OUTSTANDING ORGANIZATION.

JOHNSON BLOCK CO.

501 S. ROCKFORD
TULSA, OKLA.

FOR SAFE • DEPENDABLE LIFTING ON ALL OIL FIELD JOBS

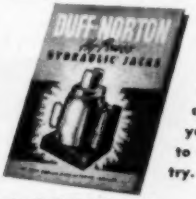
GIVE ME

DUFF-NORTON *Hy-Power Hydraulic* JACKS

If smooth, fast, easy lifting and lowering are important to you . . . you will profit by standardizing on Duff-Norton Hy-Power Hydraulic Jacks. Capable of being used in both vertical and horizontal positions, these jacks have the all-around versatility you need. In the Duff-Norton Hy-Power line you'll find the correct sizes too: capacities from 3 to 50 tons . . . closed heights from 4½ to 11 inches . . . lifting heights from 2 to 7¾ inches.

These jacks are ruggedly built to give long service under the most severe working conditions. You'll find them real time and money savers on every lifting and lowering job.

Duff-Norton Jacks include hydraulic, ratchet, screw and air motor power models, in capacities ranging from 3 to 100 tons.



Congratulations to Oil Well Supply on its 90th year of service to the oil industry.

Write for Bulletin AD 16-U, which describes and illustrates Hy-Power Hydraulic Jacks.

See your Local Distributor

STRENGTH SAFETY DURABILITY
DUFF-NORTON JACKS
ESTABLISHED 1883

THE DUFF-NORTON MANUFACTURING CO.

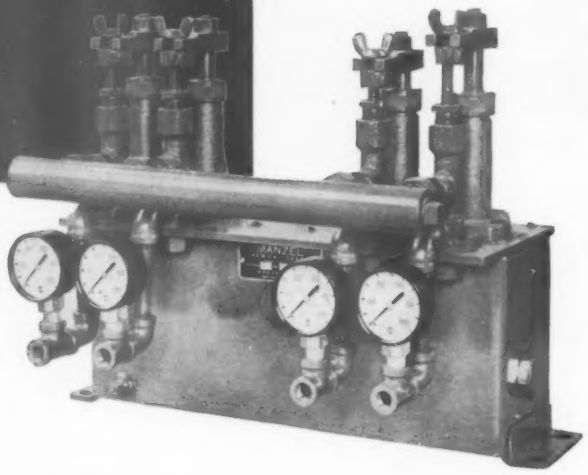
MAIN PLANT and GENERAL OFFICES, PITTSBURGH 30, PA.—CANADIAN PLANT, TORONTO 6, ONT.

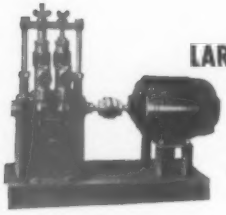
"The House that Jacks Built"

Let Us Solve Your CHEMICAL FEEDING PROBLEMS

MULTI-FEED CHEMICAL FEEDERS

Manzel flexibility permits *accurate* feeding of *many* different chemicals simultaneously. Chemicals can be pumped *into* other liquids or test samples drawn from production at regular intervals. Easily synchronized with any process. Supremely accurate proportional feeding. Any number of feeds, any type of drive.





LARGE OR SMALL CAPACITIES

Manzel Chemical Feeders pump from a fraction of a drop to 60 gph per feed . . . with *unsurpassed accuracy and dependability.* You eliminate troubles due to guesswork, inaccuracy, or forgetfulness.

Despite their time-tested dependability, Manzel Chemical Feeders are priced much lower than you might expect. They can be individually engineered for most applications. Write for details today.

Manzel

336 Babcock Street
Buffalo 10, N. Y.

Specializing in High Pressure Metering Pumps Since 1898

for safety's sake

PUT YOUR LOAD ON

the hook that has never failed

Since its development over 25 years ago, *no one* has *ever* reported the failure of a Coffing Hoist hook under any load or overload. . . . And you'll find the same careful engineering for greater safety . . . the same close attention to detail in every part of a Coffing Hoist, for example:

Safety-Pull Ratchet Lever Hoists have these safety features:

- Ratchet and pawl cannot slip or drop load.
- Handle bends at point of maximum safe overload.
- Handle will not spin or fly up.
- Factory-tested at 100 per-cent overload.

10 sizes, ¾ ton to 15 tons

Find out more about the Coffing Safety-Pull hoists that are built stronger for safety's sake. Write Dept. F5SP.

COFFING HOIST CO.
DANVILLE, ILLINOIS

Quik-Lift Electric Hoists • Safety-Pull Ratchet Lever Hoists • Differential Chain Hoists • Spur Gear Hoists • Mighty-Midget Pullers • Load Binders • I-Beam Trolleys • Hoists-Alls.

SOLD BY DISTRIBUTORS EVERYWHERE

SIMPLICITY!

Low Upkeep Cost
Trouble-Free

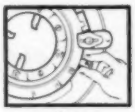
BEAVER NO. 26-R

1 TO 2-INCH PIPE THREADER

Right or left hand models

5 OUTSTANDING ADVANTAGES

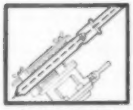
Radio Dial Setting Change in 2 Seconds



Dies Easily Removed from Outside

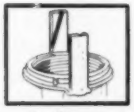
• The new Beaver 26-R is a greatly improved and simplified successor to the "old Beaver 26," popular for 40 years. Drive ring is on top—in line with dies for easy cutting. Oversize, undersize or standard threads can be cut of uniform length. Has "radio dial" setting. Change size in 2 seconds without tools. Standard taper or electric conduit threads. One set dies. No bushings.

BEAVER PIPE TOOLS, INC.
282-300 DANA AVENUE • WARREN, OHIO
"Over 50 Years of Friendly Service"

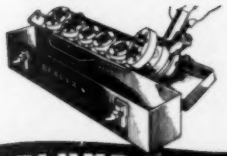


Straight Line Pull Easier Cutting

Universal Chuck · Accurate Centering · No Bushings



Cuts Taper or Straight Threads



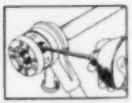
A DELUXE TOOL with enclosed ratchet — for safety

BEAVER NO. 3

THREADS PIPE 1/8 TO 1 INCH
THREADS BOLTS 1/4 TO 1 INCH

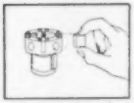
• A world-wide favorite for 40 years. Ratchet teeth fully enclosed —for safety. Openings between dies for easy oiling and chip clearance. Dies square in shape—no weak sections. Can be inverted for close threading. Made right or left-hand. Dies available for conduit and brass tubing. Die head carrier, free. Metal case available, extra. Write for new catalog.

BEAVER PIPE TOOLS
282-300 DANA AVENUE • WARREN, OHIO
"Over 50 Years of Friendly Service"



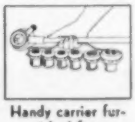
Oil and chip holes between dies.

Enclosed ratchet for safety.



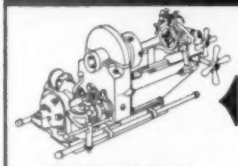
Square shaped dies, no weak section.

Bolt dies available.

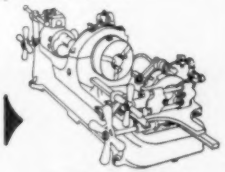


Handy carrier furnished free.

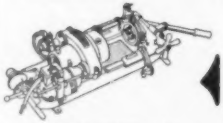
BEAVER—gives you a choice of 4 PIPE and BOLT MACHINES



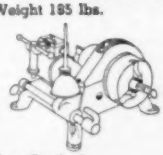
BEAVER MODEL-A
A rugged, Heavy-Duty Machine. Range ⅛ to 2". Up to 12" with Geared Tools and Drive Shaft. Bolts ¼ to 2"—Weight 365 lbs.



BEAVER MODEL-B
A Middleweight Utility Machine. Range ⅛ to 2". Up to 8" with Geared Tools and Drive Shaft. Bolts ¼ to 1½"—Weight 235 lbs.



BEAVER MODEL-E
A Lightweight Portable Machine. Range ⅛ to 2". Up to 8" with Geared Tools and Drive Shaft. Bolts ¼ to 1½"—Weight 185 lbs.



BEAVER MODEL-CI
A sturdy little Power Drive that converts Hand Tools into Power Tools—Range ⅛ to 2". Up to 8" with Geared Tools and Drive Shaft. Bolts ¼ to 1½"—Weight 140 lbs.

Write for NEW Complete Catalog!

BEAVER PIPE TOOLS, 282-300 DANA AVE., WARREN, OHIO

THINKING OF 2½ TO 4"-INCH TOOLS?

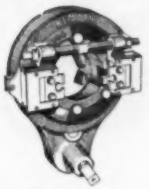
Here's a Great Team!

For hand or power use

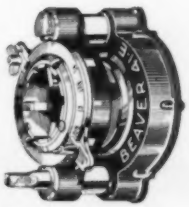
BEAVER 41-E THREADER 104 CUTTER

Beaver No. 104 Geared Square-end Knife Cutter cuts off square and clean without burr. Knives feed automatically — with safety guide ahead of cutting edge to prevent knife breakage. The No. 104 is ideal for cutting, grooving or beveling pipe. Furnished complete with operating ratchet.

Beaver No. 41-E Geared Threader is fully adjustable for undersize and oversize threads of uniform length. Threads all sizes, 2½" to 4", with one set of dies! Fully-enclosed gear case! Furnished complete with operating ratchet.



No. 104



No. 41-E

BEAVER PIPE TOOLS, INC.
282-300 DANA AVENUE
WARREN, OHIO · U. S. A.
"50 Years of Friendly Service"

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GARLOCK Mechanical Packings made from asbestos, flax, cotton, rubber, lead, copper, aluminum and other materials . . . Gaskets . . . KLOZURE Oil Seals . . . Mechanical Seals for Rotary Shafts . . . *all* are manufactured to the highest standards for superior performance and long, dependable service.

Also new and improved Garlock products result constantly from our expanded research program.

Let the Garlock representative survey your plant and make recommendations which will help increase your operating efficiency and lower your maintenance costs.

Write for catalog!

THE GARLOCK PACKING COMPANY, PALMYRA, N. Y.
Tulsa, Okla. Houston, Texas Los Angeles, Calif.

*REG. U. S. PAT. OFF.

• Included in the large list of widely used Garlock products are KLOZURE Oil Seals, Lattice-Braid Packing, 117 Valve Stem Packing, Chevron* Packing, Bitan* Leather Cups, "Teflon" Gaskets.

GARLOCK

PACKINGS, GASKETS, KLOZURE* OIL SEALS, MECHANICAL SEALS

Congratulations "OIL WELL" on 90 years of Service!

We are happy to say that the "Oil Well" is a distributor of

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— Products —

Firing Controls
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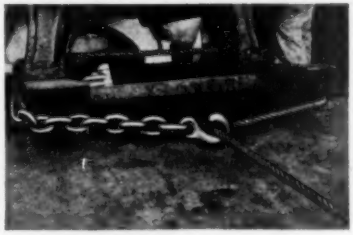
ACCO products for *High Speed* Handling and Hauling on Oil Field Trucks

● Today's heavy loads and high speeds make necessary modern, stronger, lighter chain to handle and hold materials on oil field trucks. "Mule team" hauling methods are not efficient. ACCO H. C. High Test Steel and Alloy Steel Chains provide greatly increased strength over ordinary steel chains. They stand up better under gruelling oil field service and are easier to handle because they weigh less for a given strength.

ACCO Winch Line Tail Chains and Boomer Chains have machine-formed links electrically welded. Hooks are welded into end links to become integral parts of the chain. Factory proof test and careful inspection assure satisfaction.

Winch Line Tail Chains

● The ACCO Winch Line Tail Chain, with specially designed hook, provides a strong, flexible safe ending for the wire rope. Holds safely but won't damage rope. Fine for truck, tractor, and all other winches. Sizes: ½", ⅝", ¾", ⅞".



Boomer Chains

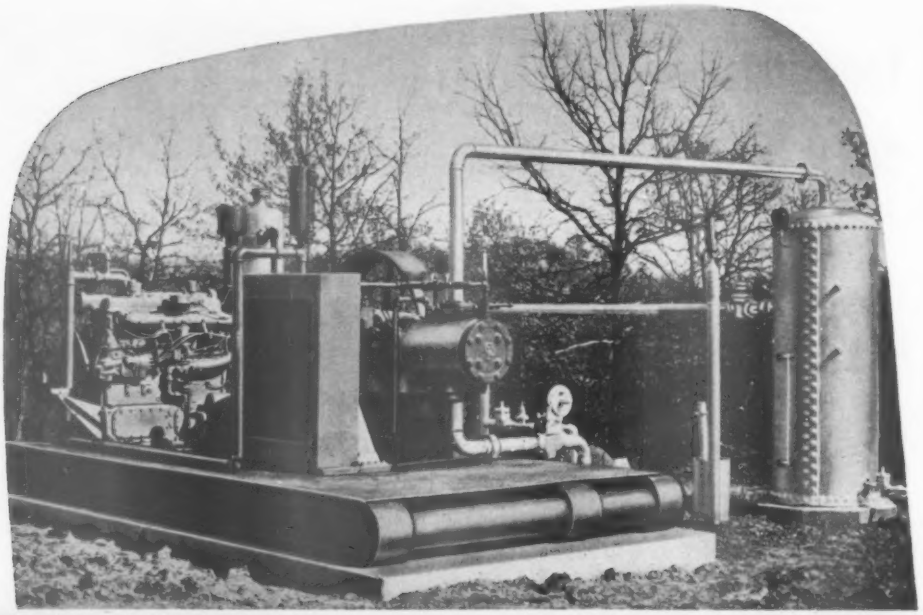
● The ACCO Boomer Chain comes in 20-foot lengths with ACCO Grab Hooks (I-beam type construction) on each end.

Easy to handle and hook up. Holds securely. Keeps load from shifting during quick stops and starts, on turns, and over rough ground. Also used for winching, hoisting, or towing. Greater strength withstands shock loads. ACCO H. C. High Test chain in green bag; Endweldur 125 chain in red bag. Boomer Chain sizes: ⅜", ⅞", ½".

Specify **AMERICAN...**
the best chain made
Distributed throughout the oil fields

ACCO
AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE
York, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

American Chain



GAS BOOSTER

package-type units

designed for —

- taking gas at low pressures and compressing it to a higher pressure for *injection into main gas lines.*
- *testing main pipe lines* in process of construction.
- *recycling* of natural gas.
- *repressuring* or secondary recovery operations.
- *gathering operations* and gas storage in underground reservoirs.

CP Gas Compressors are available —

- in sizes from 20 hp and up.
- in single and multi-stage types.
- with discharge pressures to 3000 p.s.i.

to meet specific gas-pumping requirements — whether for single-well or group-well gas-lifting operations. Write for detailed information.

Congratulations to the OIL WELL SUPPLY COMPANY on its 90th Anniversary

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MANUFACTURED AT FRANKLIN, PA.

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QUALITY PRODUCTS BY
KEM-I-KAL
SINCE 1942
CENTRALIA ILLINOIS
ENGINEERING LABORATORIES INC.

SEAL OF QUALITY AND SERVICE

OILFIELD
CHEMICALS

PARAFFIN SOLVENT

PHOSTONE Water Treet

USES: Stop Calcium Carbonate, (gype) corrosion.

SULPHON Water Treet

USES: Stop Hydrogen Sulphide, Sulfate corrosion.

SANPENT wetting agent

USES: reduce pressure tension in water-flooding injection.

KAL-KNOT

USES: Treatment of waters to eliminate calcium deposits where used in water-flooding.

AMERICA'S FINEST – READY MIXED

PAINTS, ENAMELS AND COATINGS
for industry, farm and home

Distributors throughout the Oil Industry

OIL WELL SUPPLY DIVISION
United States Steel Company

ALSO AVAILABLE AT MANY
OTHER LEADING SUPPLY STORES

WIRE OR WRITE IF NOT AVAILABLE NEAR YOU

LUFKIN ANCHOR
chrome-clad steel tape—NO GLARE—
easy to read in bright or
dull light

Lufkin chrome-clad steel tapes are stronger—more durable because they are built up with a series of platings that become an integral part of the line. They are easier to read because jet black markings and figures stand out sharp and clear against the chrome white background.

The "Anchor" chrome-clad tape has a genuine leather case, hand stitched, Mahogany color. Case liner is of coated steel, rust and corrosion resistant. Plated trim. No protruding winding handle as it winds with a folding flush handle opened with a push pin.

Strength, durability, accuracy, and beauty are all combined in the "Anchor" tape. Order the "Anchor" from your nearest supply house.

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TAPES • RULES • PRECISION TOOLS
From Your Supply House

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Walworth Company
manufacturer of a complete
line of valves and fittings
for 110 years

SALUTES ITS DISTRIBUTOR

Oil Well Supply Division

United States Steel Company

on its

90th

Anniversary

WALWORTH

valves . . . fittings . . . pipe wrenches

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Distributors in principal centers
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Congratulations

TO

Oil Well Supply Co.

on their

90th Birthday

and their

Continued Leadership

We, too, are working continuously to serve the oil industry better!

- Second-growth Hickory Tool Handles
- Shovel Handles
- Gauge Poles
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OKLAHOMA RIG & SUPPLY CO.

MUSKOGEE
OKLAHOMA

Greatest Name in Cable Tools:

ACME

TRUSTWORTHY SINCE 1900

Over a Half-Century's Foundation of Acme Specialized Experience in Cable Tools IS Your Constant Assurance of Their TRUSTWORTHY Field Service.

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DRESSER *Congratulates*

90 year old

OIL WELL SUPPLY CO.

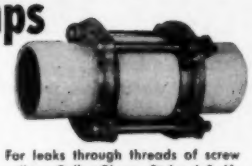
who for years have handled Dresser products

MIGHTY HANDY...to have around wherever there's pipe

Dresser Clamps

Just four in Dresser's complete line of repair products. Be ready for fast repairs by keeping Dressers in stock. They are the handiest, quickest way to repair leaks . . . in any weather . . . on any pipe . . . and without shutting down your lines.

Check your nearest oilfield supply store for any of Dresser's repair products, or write for our Oil-Field Catalog.



For leaks through threads of screw collars. *Collar Clamp*, Styles 4 & 41.

For leaks and holes in run of pipe. *Bond Clamp*, Style 778.

For repairing leaks in circumferential welds. *Parous Weld Clamp*, Style 55.

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DRESSER REPAIR CLAMPS

Dresser Manufacturing Division, 59 Fisher Ave., Bradford, Pa.
(One of the Dresser Industries)
WAREHOUSES:
1121 Rothwell Street, Houston, Texas
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Congratulations to

Oil Well Supply Company on their 90th anniversary of service to the Oil Industry.

HENRY H. PARIS DISTRIBUTOR, INC.

HOUSTON, TEXAS

S & R THREAD PROTECTORS

Save collar and sub thread damage! S & R thread protectors not only prevent damage to joints, but also provide a simple, safe and convenient means for lifting heavy drill collars and subs.

Made of cast steel, carefully machined to established specifications. They will make up and shoulder like any standard tool joint. The heavy lifting eye is cast integrally with the body of the protector . . . provides plenty of room for winch or cat lines. Available for any standard tool joint thread, from 2⅞" to 6⅝". All threads cut extra long to accommodate extra long joints on collars or subs.

Save damage . . . save money . . . the cost of recutting one thread on a collar or sub is usually more than the cost of an S & R protector.

S & R TOOL & SUPPLY CO.
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HOUSTON 1, TEXAS
Export: Mid-Continent Supply, 42 Broadway, New York 4, N. Y.

CONGRATULATIONS TO THE
OILWELL SUPPLY CO.
ON THEIR 90TH YEAR OF SERVICE
TO THE PETROLEUM INDUSTRY

SUSMAN'S "SUPERIOR" BRAND WIPERS

THEY'RE STERILIZED!

Packed in new cartons of 5, 10, 25 and 50 pounds each and in bales from 50 pounds up.

AVAILABLE FOR IMMEDIATE DELIVERY IN ALL QUANTITIES

UNCONDITIONALLY GUARANTEED TO SATISFY YOUR CUSTOMERS

Free of all buttons, pins, hooks, eyes and other metallic substances, cut open and 100% washed and sterilized in our own operated sterilization plant.

NATIONALLY DISTRIBUTED BY
OILFIELD SUPPLY STORES

"IT IS OUR PLEASURE TO SERVE YOU"

Susman Wiping Materials Co., Inc.
1114-32 N. MARKET ST. ST. LOUIS 6, MO.

Pumps 990 gallons of mud a minute

with help of TIMKEN® bearings

THIS Oil Well Supply model 220-P power slush pump, used for deep-well drilling, has a cast steel fluid end with a rated working pressure of 4,000 psi. Its large streamlined passages permit heavy mud flows—as much as 990 gallons per minute!

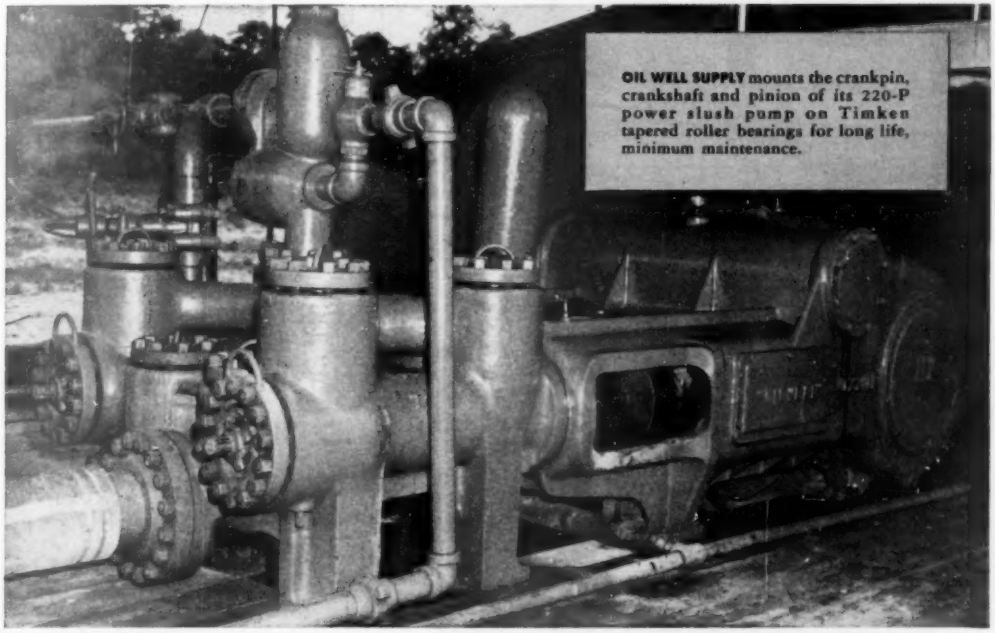
To assure smooth, trouble free operation with minimum timeout for maintenance, Oil Well Supply engineers specified the same bearings they have been using in their slush pumps since 1928—Timken® tapered roller bearings.

Timken bearings on the crankshaft take both radial and thrust loads, hold the shaft in proper alignment, minimize deflection and end play. On the gear and pulley ends of the pinion shaft, Timken bearings carry the heavy gear loads, insure accurate and smooth gear mesh. Long gear life is assured, power is transmitted smoothly.

Line contact between the rollers and races of Timken bearings provides extra load-carrying capacity. And due to their true rolling motion and incredibly smooth surface finish, they practically eliminate friction, reduce wear.

No other bearing can offer you all the advantages of Timken bearings. Be sure to specify them for the machines you build or buy. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



OIL WELL SUPPLY mounts the crankpin, crankshaft and pinion of its 220-P power slush pump on Timken tapered roller bearings for long life, minimum maintenance.

WE MAKE OUR OWN STEEL

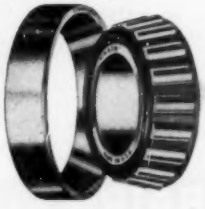
The special grade alloy steel which gives Timken bearings their strength and resistance to wear is made in our own steel mills.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

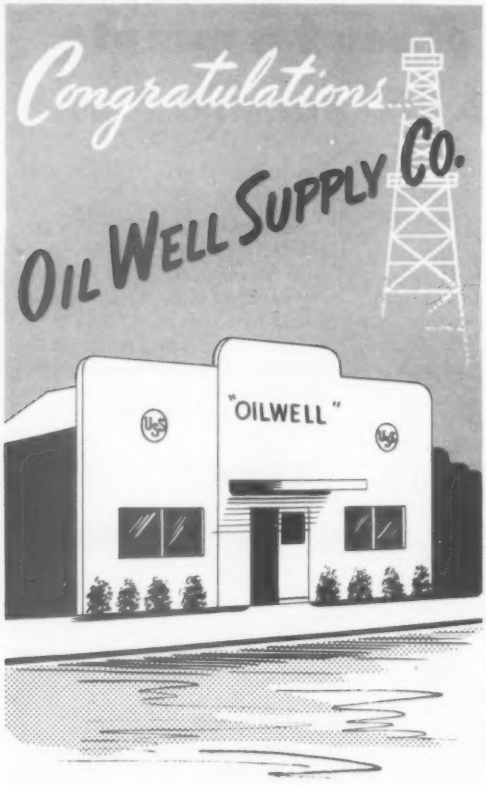
TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION



Today . . . as throughout your ninety years of operation, "Oilwell" continues to follow important oil discoveries — supplying the machinery and equipment for the Petroleum Industry. Your slogan — "Oilwell was there" has been proven time and time again by the many years of outstanding service to the Industry.

Baird Manufacturing Company is proud to extend congratulations to Oil Well Supply Co. on this important occasion.

BAIRD MANUFACTURING CO.
P.O. BOX 380-TULSA

OIL WELL SUPPLY COMPANY

has stocked our **REPAIR CLAMPS** *and* **SADDLES** *in all of their field stores for over half a century!*

M. B. SKINNER CO., SOUTH BEND 21, INDIANA

"CONGRATULATIONS TO THE OIL WELL SUPPLY COMPANY ON 90 YEARS OF VERY SUCCESSFUL OPERATION."

The Marshall Car Wheel & Foundry Company
P. O. Box 1029, telephone 2348, Marshall, Texas.

Manufacturers of grey iron castings for oil field equipment.

UNIT RIG SERVICE PARTS . . . ALWAYS FIT

Unit Rig has never had a parts replacement job that couldn't be done on the rig floor! Old parts may be removed and new parts installed right on the rig floor, because there are no press nor shrink fits that require special equipment.

Extremely close machine tolerances and repeated inspections assure quick and easy fitting without filing, grinding, welding or re-machining.

Prompt delivery of *parts that fit* is one more reason why you save time and money when you own Unit Rig equipment. Make your next drawworks a Unit Rig.

UNIT RIG & EQUIPMENT CO. TULSA, OKLAHOMA U.S.A.

DESIGNED FOR THE JOB....

UR-512

UNIT RIG DRAWWORKS ARE SOLD EXCLUSIVELY THROUGH THESE AUTHORIZED DISTRIBUTORS IN U.S.A. AND CANADA

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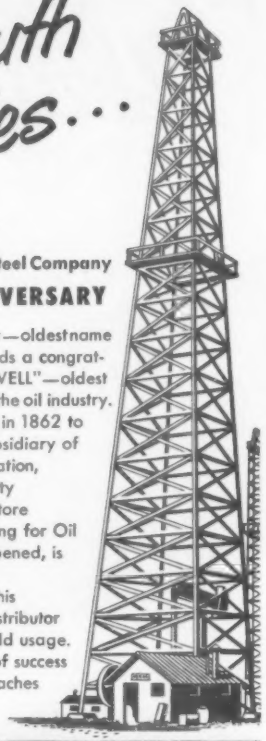
MID-CONTINENT SUPPLY COMPANY
NORVELL-WILDER SUPPLY COMPANY
OIL WELL SUPPLY COMPANY

EXPORT SALES—MID-CONTINENT SUPPLY COMPANY, 42 Broadway, New York City. **Cable**—MIDUNITRIG

Plymouth Salutes...



OIL WELL SUPPLY
Division of United States Steel Company
ON ITS 90th ANNIVERSARY

Plymouth Cordage Company—oldest name in the rope industry—extends a congratulatory handshake to "OILWELL"—oldest name in field equipment for the oil industry.

From its baby beginning in 1862 to its present position as a subsidiary of United States Steel Corporation, "OILWELL" has set its quality standards high. Its mobile store service, supplying "Everything for Oil Wells" as new wells are opened, is without parallel.

We are proud to have this organization as national distributor of Plymouth rope for oil field usage. Here's to another decade of success for "OILWELL" as it approaches the century mark!

PLYMOUTH CORDAGE COMPANY
PLYMOUTH, MASSACHUSETTS

TO—
OIL WELL SUPPLY CO.
(DIVISION U. S. STEEL CO.)

OUR Congratulations

For 90 Years of Unexcelled Service

We're proud to have been serving You and your Branches for more than 35 years as suppliers of—

AIR COCKS • WATER GAUGES • COMPRESSION GAUGE COCKS

CONSOLIDATED BRASS COMPANY

DETROIT 9, MICHIGAN

industry rolls on Tyson bearings

Full-roll tapered ... TYSON carry maximum ... radial and thrust. Size for ... TYSON anti-... bearings provide more rolls for ... maximum capacity, rigidity and service life. Distribution of loads over ... engagement of tapered rolls assures ... operation even at full capacity.

TYSON roller bearings ... made of special bearing alloy ... cageless types—a ... of sizes to meet eve... requirement.

Tyson salutes Oil ... Company (a user of Tyson ...) on their 90th Anniversary.

Tyson
BEARING CORPORATION

638-TY

1278 Oberlin Rd. • Massillon, O.

Congratulations

"OILWELL"

on your

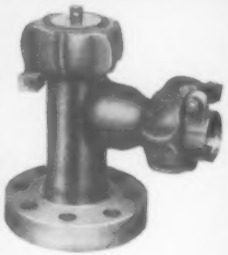
90th ANNIVERSARY

of uninterrupted service to the petroleum industry

Your success is well deserved! You have consistently exerted every effort towards maintaining a dependable service and supply of quality oil field products. We take pride in the fact that American Iron Products are distributed by Oilwell Supply Stores. We wish to express our appreciation for the splendid relationship we have enjoyed with OILWELL during our more than 28 years of manufacturing experience.

AMERICAN IRON & MACHINE WORKS CO.
MANUFACTURERS OF
A
OIL FIELD EQUIPMENT
OKLAHOMA CITY U.S.A.

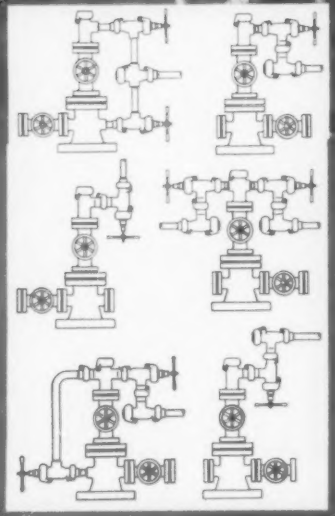
The Right Combination



The UNIBOLT Tee (or Cross) with blanking plug on top is available in flanged, flanged by screwed, flanged by Unibolt, etc., and in any combination of sizes.

The UNIBOLT Wing Valve takes the place of a gate or plug valve on the wing of the tree to provide a dependable shut-off for choke changing. Since high pressure wells are usually produced through a small choke, resulting in low velocity flow through the tree, the one-inch opening in this valve is ample to assure unrestricted flow.

The UNIBOLT Choke Body, fitted with positive bean ("X" Type increments of 5% and 10% of flow, or regular beans of 1/64" increments) provides proven, dependable, safe and convenient flow control.



...to make any tree lighter, stronger and more economical

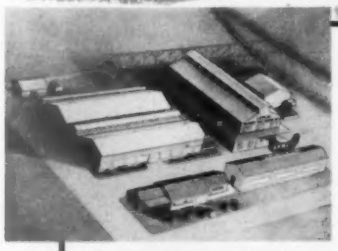
Employing standard UNIBOLT connections rather than flanges, the UNIBOLT Flow Manifold is many pounds lighter, yet the UNIBOLT design, which places more steel in shear, actually results in a higher factor of safety for the manifold.

The units of the manifold — UNIBOLT Tee or Cross, Wing Valve and Positive Choke Body — are pressure-tested as a unit and may be assembled in a number of combinations to best meet individual needs. They are furnished in regular forged steel or in high-chrome alloy for corrosive wells — 6,000, 10,000 or 15,000 P.S.I. test. The manifold is completely interchangeable.

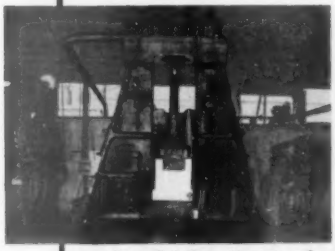
THORNHILL-CRAVER CO. P. O. BOX 1154 • HOUSTON, TEXAS

UNIBOLT *Flow Manifolds*

WILL NOT SPREAD
CAN'T PULL APART
LeBus "Bulldog" Load Binder
LeBus Releasing Washover Overshot
LeBus Knuckle Joint Type FO-47
LeBus Releasing & Circulating Overshot & Overshot Guides
LeBus Inside Casing & Drill Pipe Cutter
LeBus "Winch-line" Tail Chains
LeBus "Drop-Forged" Swivels
LeBus Circulating and Releasing Rotary Spear and Liner Setter
LeBus "All Purpose" Snatch Blocks
LeBus Industrial Hooks & Missing Links
LEBUS



LeBus Plant and Home Office



One of 5 Drop Hammers in LeBus Forge Plant

Symbol of QUALITY tools

For over forty years, LeBus has served the industry, ever-striving to produce only the best in rotary tools and truck equipment. LeBus designs have kept apace of increasingly complex requirements and their manufacturing facilities have constantly been improved and expanded to meet the growing demands. Today, the modern LeBus plant is thoroughly equipped to produce only the finest tools . . . tools you can depend on . . . tools that are truly the *Symbol* of *QUALITY!*

Congratulations to "OILWELL" on their 90 years of continuous service to the oil industry.

LEBUS ROTARY TOOL WORKS, inc.

BOX 2352 PHONE 1232, L.D. 5

LONGVIEW, TEXAS

A GREAT NAME IN OIL PRODUCTION

Serving the industry for 90 years

"OILWELL"

Texas Iron Works is proud to be associated with so great a name in the multi-billion-dollar oil production industry . . . Oil Well Supply Division of United States Steel Company . . . a company entering its 90th year of uninterrupted service to [illegible] in oil production.

We are happy to have had a part in the contribution "OILWELL" has made to the industry . . .

The revolutionary TIW Mudmaster is a mixer requiring only 20 horsepower to do the mixing job that normally requires a 200 horsepower slush pump, with the conventional mud gun. It is adaptable to all types of power and fuel usually found on a drilling rig.

Driven either by steam turbine on steam rigs, electric motors where sufficient power is available, or diesel or gas internal combustion engine, a propeller agitates the mud in the pit while a conveyor on the shaft feeds the dry mud to the liquid.

The unit may be mounted on the side of a steel tank as a permanent fixture or can be skid mounted for use on earthen pits.

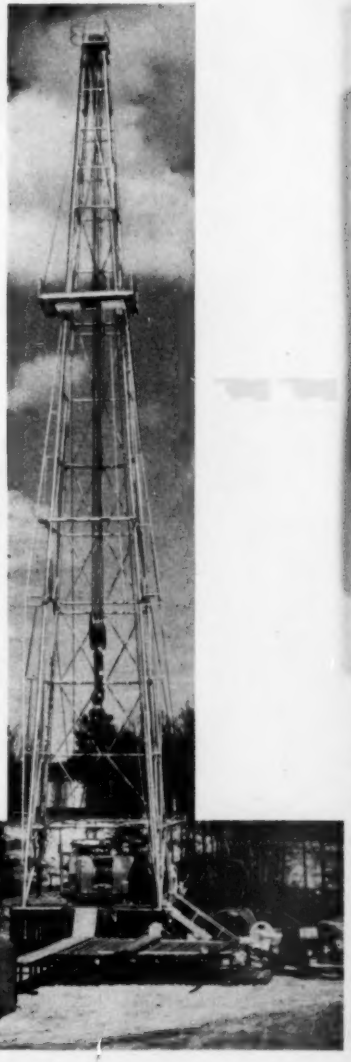
TEXAS IRON WORKS

Manufacturers of: T.I.W. Portable Rigs . . . T.I.W. Safety Joints . . . T.I.W. Rotary and Casing Slips . . . T.I.W. Grief Stem Safety Valves . . . T.I.W. Gas Lifts . . . T.I.W. Packers for every purpose . . . T.I.W. Pump Chambers . . . T.I.W. Mudmasters . . . T.I.W. Drillmasters . . . and many other oil field tools.

GENERAL OFFICE and MAIN PLANT: 1401-1423 Maury Street, Houston 10, Texas
Other Shops at Victoria and Corpus Christi.
EXPORT REPRESENTATIVE: Val R. Wittich, 30 Rockefeller Plaza, New York, N. Y.

3469

90 years is a long, long time



Greetings and Congratulations to

"OILWELL"

and may the next 90 years bring even greater progress and success in all your undertakings.

45 years is a long time, too! — Since introduction of the original Baker Casing Shoe in 1907, our cordial relationship with OILWELL has been one which we value highly.

BAKER OIL TOOLS, INC.

HOUSTON • LOS ANGELES • NEW YORK

USS
"OILWELL"
SUPPLY DIVISION
In the shadow of new and old fields throughout the country, Oilwell stores are ready day or night to serve you with any product that Mission manufactures. On this 90th anniversary, Mission joins the industry they serve so well in a salute to Oil Well Supply Company.
MISSION
MANUFACTURING CO.
HOUSTON, TEXAS

Congratulations

to

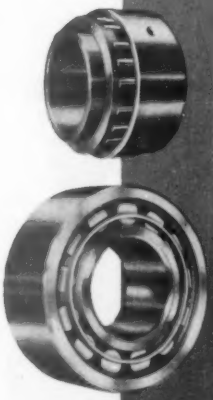
OIL WELL SUPPLY CO.

on its

90th Anniversary

The petroleum industry has come a long way since Oil Well Supply Company opened shop nearly a century ago. But progress, from the spring pole of those days to modern production methods, was possible only through the development of progressively more efficient machinery, tools and equipment to meet the industry's needs and anticipate its expanding requirements. To this program Oil Well Supply Company has been a major contributor.

For more than thirty years American Roller Bearing Company has been privileged to develop many of the heavy duty roller bearings necessary to carry the ever increasing loads required of today's powerful oil country equipment. Tomorrow's still greater needs will find American Roller Bearing Company making roller bearings to meet and exceed the maximum demands of continued progress.



AMERICAN ROLLER BEARINGS HEAVY DUTY

AMERICAN ROLLER BEARING CO.

416-420 MELWOOD AVENUE • PITTSBURGH 13, PA.

Pacific Coast Office: Edward D. Maltby Co., 1718 S. Flower St., Los Angeles, Cal.

LUNKENHEIMER JOINS "OILWELL" . . .

in celebrating

90 YEARS OF SERVICE TO THE OIL INDUSTRY

Fig. 2125

"OILWELL" and Lunkenheimer have worked side by side for nearly a century to serve America's petroleum industry. Both organizations celebrate their 90th Anniversaries this year. We at Lunkenheimer are proud to salute "OILWELL" — one of our first customers. You can count on the dependability and performance of Lunkenheimer Bronze, Iron and Steel Valves and "OILWELL" service.

Fig. 1640

BRONZE • IRON • STEEL

L-252-33

LUNKENHEIMER

THE ONE *Great* NAME IN VALVES

"Oilwell" looks to ANCHOR for oil-field hose assemblies and fittings to make equipment *safer, more dependable*

These are the reasons Anchor Reusable Couplings simplify your hose assembly jobs — reduce expense.

No special tools needed to assemble couplings and hose.

Exclusive patented grip is leakproof — eliminates blowoffs.

Reduces inventories needed in replacement lengths.

Repairs made immediately on job — less downtime.

"Oilwell" has made an enviable record — 90 uninterrupted years of serving the petroleum industry. With all this experience, "Oilwell" people know the importance of safety and dependability. That's why they look to Anchor for oil-field hose assemblies and fittings. They know that Anchor means leakproof dependability, extra safety, less downtime, and assured satisfaction.

Join the long list of well-known names throughout the petroleum industry that are standardizing on Anchor. Write for further information — find out how Anchor hose assemblies and fittings save time, trouble, and money for you.

ANCHOR COUPLING CO. INC.
Libertyville, Illinois

BRANCHES:
2100 Irving Blvd., DALLAS, TEXAS
DETROIT, MICHIGAN

Oil Well Supply Co.

WE CONGRATULATE YOU ON YOUR 90TH ANNIVERSARY

We are happy indeed to be among those who serve you. We shall continue to make every effort to meet your requirements for oil well drilling equipment—oil tools modern in design and of the highest quality.

Our best wishes for your continued success.

VARCO

OIL WELL TOOLS

Abegg and Reinhold Co.
2533-2541 EAST 24th STREET • LOS ANGELES 58, CALIFORNIA

Congratulations

TO

Oil Well Supply Co.

ON YOUR

90th Anniversary

Our affiliation has been most pleasant and progressive, for by our service to you, we are serving the increasing needs of the ever-expanding petroleum industry.

H. P. GOTT MFG. CO.
WINFIELD, KANSAS

Cameron

FIRST NAME IN DRILLING CONTROL

Before you drill your next well in either proven or wildcat territory, take stock of your drilling control equipment and replace obsolete, worn, or inadequate units. It might mean the difference between a successful drilling operation and a disastrous blowout. Make sure that your investment in costly well bore and drilling machinery has the world's most dependable insurance . . . *a modern and complete Cameron drilling control manifold.*

CAMERON IRON WORKS, INC., Houston, Texas

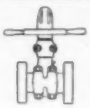
Export Office: 74 Trinity Place, New York, N. Y. ● Sterling Area: British Oil Field Equipment Co., Ltd., Duke's Court, St. James's, London S.W.1, England ● California: Cameron Iron Works of California, Box 267, Long Beach ● Canada: Cameron Iron Works of Canada, Ltd., 9860-88th Ave., Suite 3, Edmonton, Alberta.

SELLING THROUGH SUPPLY STORES

Pressure-Operated Blowout Preventers

Pressure-Operated Flowline Valves

Alloy Steel Mud Crosses


Flex-Seal Mud Valves

Adjustable and Positive Chokes

Mud Line Pressure Gauges

Be **SURE** *you know, use* **TOTCO**

Distributed in Canada exclusively by the Oil Well Supply Division, United States Steel Company

Even our "Head Man" can count only 43 years of making oil tools, such as tongs, hooks and elevators, but we plan on making a lot more before we are 90 years old, like "OILWELL."

If we can predict the *future* from our *past* pleasant relations, a good percentage of WEB WILSON OIL TOOLS will be sold through "OILWELL" and we can't imagine a nicer way to spend the next 47 years.

W. A. Wilson
Vice Pres. & Gen. Mgr.

B. M. Landis
General Sales Manager

W. W. (Web) Wilson
President

WEB WILSON

Oil Tools, Inc.

14905 South San Pedro St., Los Angeles 2, California

Representatives in All Active Oil Fields

FIELD PROVEN

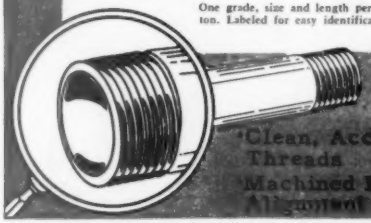
Challenge Steel Nipples

IMPORTANT TO YOU!

Prompt Delivery!

You can be assured of competent service and prompt delivery when ordering steel nipples from FRICK & LINDSAY. Available in all sizes . . . ⅛" to 12" dia. for lengths from close to 12" inclusive. Standard, Extra Heavy & Double Extra Heavy Weights. Carton quantities as approved by U. S. Dept. of Com. National Bureau of Standards, addenda to Com. Standards CS 5-46 dated March 22, 1950.

One grade, size and length per carton. Labeled for easy identification.



FRICK & LINDSAY CO. 117 Sandusky St. Pittsburgh 12, Pa.

Only JUSTRITE* has SAFETY CANS with All These Features!

JUSTRITE

For FAST, EASY & SAFE HANDLING of all flammable liquids.

Patented "Pouring Lip" reduces spilling. Swinging handle balances load . . . makes pouring easier on 2, 3 and 5 gallon sizes. Trigger handle for one hand operation on 1 Pt. to 1 Gal. sizes. Spring-closing spout cap. Labeled by Underwriters' Labs. and Factory Mutual.

FLEXIBLE HOSE ATTACHMENT for faster, easier pouring.

Easily attached to any ½ gal. or larger JUSTRITE Safety Can. 9½ inches long, spark proof brass cup and tip. No. 1088, $2.80.

*JUSTRITE . . . world's leading manufacturer of Oily Waste Cans, Safety Cans and Safety Flashlights.

JUSTRITE MANUFACTURING CO. FREE CATALOG Write Dept. OGJ 2061 N. Southport CHICAGO 14, ILL.

HERCULES TOOL TULSA HERCULES

Congratulates "OILWELL" SUPPLY COMPANY

ON THE OCCASION OF THEIR 90th Anniversary

It should be an occasion for celebration when a firm has reached the ripe age of 90 years. Hercules, as a comparative youngster, is proud to be numbered as one of the suppliers of the many fine products sold through "OILWELL" SUPPLY STORES. Hercules products have been sold through "OILWELL" SUPPLY STORES since 1925.

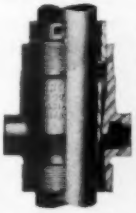
HERCULES PRODUCTS

Duplex Polished Rod STUFFING BOXES

Hercules manufactures three types of Duplex Polished Rod Stuffing Boxes — the Regular or Standard, the Tee Base Type and the Double Packed. Each is designed to perform outstandingly.

CASING HEADS

Hercules manufactures the Berry Pattern, Louisiana Pattern and Medium and Low Pressure Casing Heads with slips. All are time-tested and approved by usage wherever oil is found.



TUBING HEADS

Eight different types of Ship suspension and Stripper Tubing Heads are manufactured by Hercules, each designed to simplify the hard job of oil production.

Other well known Hercules Products are Tubing Hangers, Pumping and Flowing Tees, Special Cross Tees and Casing Head Adapters and Special Tubing Heads for Reda and Kobe Pump installations.

HERCULES PRODUCTS ARE SOLD THROUGH ALL "OILWELL" STORES

We will welcome your request for complete information on any Hercules Product.

HERCULES TOOL COMPANY

Manufacturers of Oil Field Equipment

TULSA, OKLAHOMA

General Office and Plant: 17th and Peoria — P. O. Box 296
Telephone 3-1186 Cable Address "HERTCO"

Export Representatives: OIL FIELD EQUIPMENT CO., INC.
T. E. Ward, President 30 Church St. New York 17, N. Y.

Eliminate SHOCK HAZARD!

*ALFCO ANTI-STATIK HORN Device grounds static electricity, insures safety.

Sectional view of Alfco Anti-Statik Horn

ALL ALFCO CARBON DIOXIDE FIRE EXTINGUISHERS WITH HOSE CONNECTIONS HAVE ALFCO ANTI-STATIK HORNS

All commercial Alfco Carbon Dioxide Extinguishers having hose connections are equipped with an exclusive Alfco Anti-Statik Discharge Horn which grounds static electricity, eliminating the possibility of shock to the operator from a static charge generated by rapid release of gas. Smaller size units with shorter swivel type horns do not require this feature. There is a capacity size model to meet your requirements from 20 lbs. down to 2½ lbs. Wheeled Engines also available in 50, 75, and 100 lb. sizes.

* On All ALFCO Carbon Dioxide Hand Portable FIRE EXTINGUISHERS and WHEELED ENGINES EQUIPPED WITH HOSE CONNECTIONS

AMERICAN-LAFRANCE-FOAMITE Corporation
ELMIRA · NEW YORK · U.S.A.

ALFCO

We congratulate OILWELL on the achievement of their 90th year of uninterrupted service to the petroleum industry.

MODIFICATION CENTER and warehouse at Garland, Tex., built to better serve the oil-industry requirements in the Southwest.

Grandpa Had to Walk

WORKING for "Oilwell" is virtually a hereditary occupation for quite a few of the company's employes, but the record probably belongs to Kenton Chickering, general sales staff manager, for both his father and grandfather spent large portions of their lives with Oil Well Supply Co.

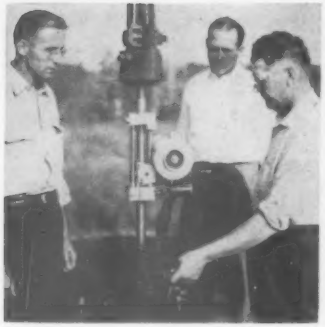
The original Kenton Chickering helped John Eaton found the business and was one of the very first supply men. Recently Ken ran across Grandpa Chickering's diary which threw some interesting sidelights on the nature of the industry in the early days. Here are some excerpts from an 1878 entry relating how a supply man had to scrounge for business in the wilds of West Virginia.

"Volcano is a town of about 2,000 inhabitants; is approached over a switchback road of about 3 miles in length over a wild, picturesque country. The road in places climbs the mountain at a grade of 240 ft. per mile, crossing ravines of 80 to 100 ft. in depth on trestle-like bridges . . .

"Left Volcano after breakfast for Laurel Junction on foot over Briar Knob Mountain. About half way over it commenced to rain, but I pushed on and arrived at the B. & O. Railroad just in time to be too late for the train. Tried to find a place to stop, but could find no place to rest my tired feet. Tried to find a farmer who possessed a buggy of some sort to take me to Parkersburg, but could not. Finally had to hoof it back to Volcano where I arrived tired and wet but in time for dinner. . . . After dinner that evening for diversion I took a walk through the field and looked at the wells. . . .

"I find the wells (at Volcano) vary much in depth, some being but 300 to 400 ft. while others in the same neighborhood are 1,300 or 1,400 ft. There is also a great difference in the gravity, some being as heavy as 26° gravity

TRIPPLEHORN SCRAPERS
INSTALLED AT WELL!
• REMOVES PARAFFIN • NO WELDING NECESSARY • SAVES TIME • SAVES MONEY
★ CAN BE SALVAGED and used again on new rods.
★ Spaced for any stroke length.
★ Will not slip if rod is stressed. Tested for 2350 lbs. grip.
★ Now in use in EVERY AREA where paraffin is a problem.
★ Sizes available for IMMEDIATE delivery to fit ⅝" to 1" rods in 2", 2½" and 3" tubing.
AVAILABLE THROUGH YOUR SUPPLY STORE
Conveniently packaged and easily identified!
DISTRIBUTED BY SUCKER ROD MANUFACTURERS
MANUFACTURED BY
The TRIPPLEHORN CO.
P O BOX 6326 • DALLAS TEXAS



Testing and Research

The three photographs above testify to "Oilwell's" activity in testing and research. In the first view is shown a dynagraph well-surveying instrument on a pumping well. Next is seen a metallurgist making check tests on sucker-rod specimen of yield and ultimate strengths. Last is seen an engineer undertaking precision machining of test specimens (fatigue, tensile, izod impact, and other routine and special tests will be carried on).

Congratulations

to

Oil Well Supply Company

As a working partner in America's great petroleum industry, Big Four Machine and Supply Company congratulates the Oil Well Supply Company on its 90th anniversary of progress in the oil field supply business.

Big Four's contribution to the oil industry lies in its specialized oil field equipment repair service and manufacturing facilities. Many firms throughout the United States have profitably used Big Four's accurate and dependable repair services and Big Four engineered equipment.

BIG FOUR MACHINE AND SUPPLY COMPANY 4

Big Four Manufactured Equipment Includes:

• LONG SWEEP ELLS • GOOSENECKS • RELEASE VALVES • SLIM HOLE SWIVELS • SUCTION STRAINERS • LONG DRILL COLLARS • HIGH PRESSURE FITTINGS • SLIM HOLE ROTARY TABLES • TRAVELING BLOCKS AND HOOKS

BIG FOUR MACHINE AND SUPPLY CO.

Main Office: 1013-14 Hales Bldg.; Oklahoma City, Okla.; Phone 79-1139

Shops and Plants

PAWHUSKA, OKLA. Box 477 — CLAY CITY, ILL. Box 256

BEAVER TOOL & MACHINE CO., Maysville, Okla. Manufacturer of Big Four Products

Complete Warehouse Stocks Available at:

C & W MACHINE WORKS COMPANY, Great Bend, Kansas

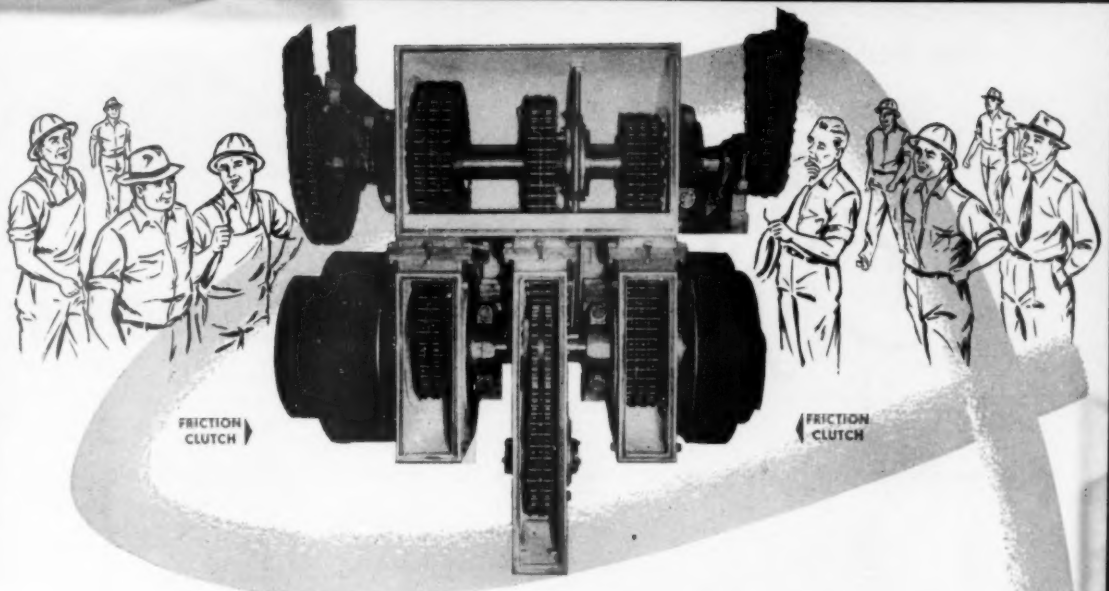
TILLERY AND PARKS, Odessa, Texas

while others produce 53° gravity. Mr. Whitman has a well on Mud Lake which at 350 ft. produces about 1½ bbl. of 26° oil. The same well was put down to 1,400 ft. and produced at that depth about 3½ bbl. of 52° oil. There are wells in this district producing two kinds of oil in the same well. . . .

"The wells are usually small and average less than 4 bbl. per day. The wells being so small, they have to be operated in a cheap way, so they couple up several at a time with wire rope and in this way one engine and boiler sometimes pumps as high as 14 wells at once. One advantage of the wire-rope system is that it in no way interferes with the ability to use the bull wheels or sand reel. In fact, it can be done as well with the wire rope as with the direct use of the engine. Sometimes six or eight wells are run with a single rope. . . ."

Missionary Work

AFTER doing its bit to teach the Japs not to trespass on other's property, an "Oilwell"-Witte Dieselectric power plant is now bringing light to the natives in the Solomon Islands. This tale of the South Pacific recently came



Why Do 95% of Rig Customers Want a Friction Clutch Transmission?

IS THE JAW CLUTCH TRANSMISSION OBSOLETE? OUR CUSTOMERS THINK SO!

WILSON introduced the FIRST ALL FRICTION CLUTCH DRIVE TRANSMISSION and drilling rig, for use either with or without torque converters 3½ years ago.

During this period more than 100 of these WILSON FRICTION CLUTCH TRANSMISSIONS have been sold and put into service and have given a remarkable account of themselves!

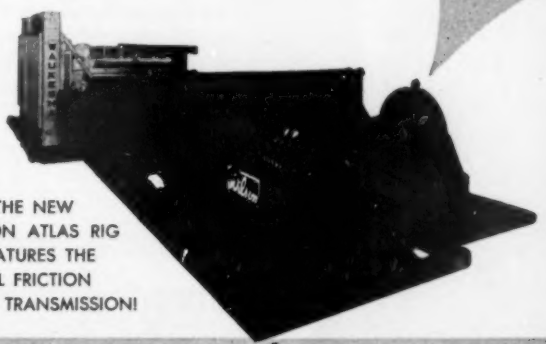
Although we still offer for sale the Jaw Clutch Transmission which we have always built, a recent survey revealed that 95% of our orders now are for FRICTION CLUTCH TRANSMISSIONS! This is why we say our customers have told us in no uncertain terms that jaw clutch transmissions are obsolete.

Greater ease of control, more flexibility, and freedom from trouble have influenced every customer who has bought this Friction Clutch Transmission to specify it exclusively on any new rigs purchased.

It will pay you to remember this fact when you purchase your next drilling rig. Insist on a drilling rig with ALL SPEEDS obtained with FRICTION CLUTCHES. ONLY WILSON builds the modern *all friction clutch transmission*. So, why buy obsolete equipment?

Only Wilson Builds the Modern ALL-FRICTION CLUTCH TRANSMISSION

Congratulations to "OILWELL" on Their 90 years of Continuous Service to the Oil Industry



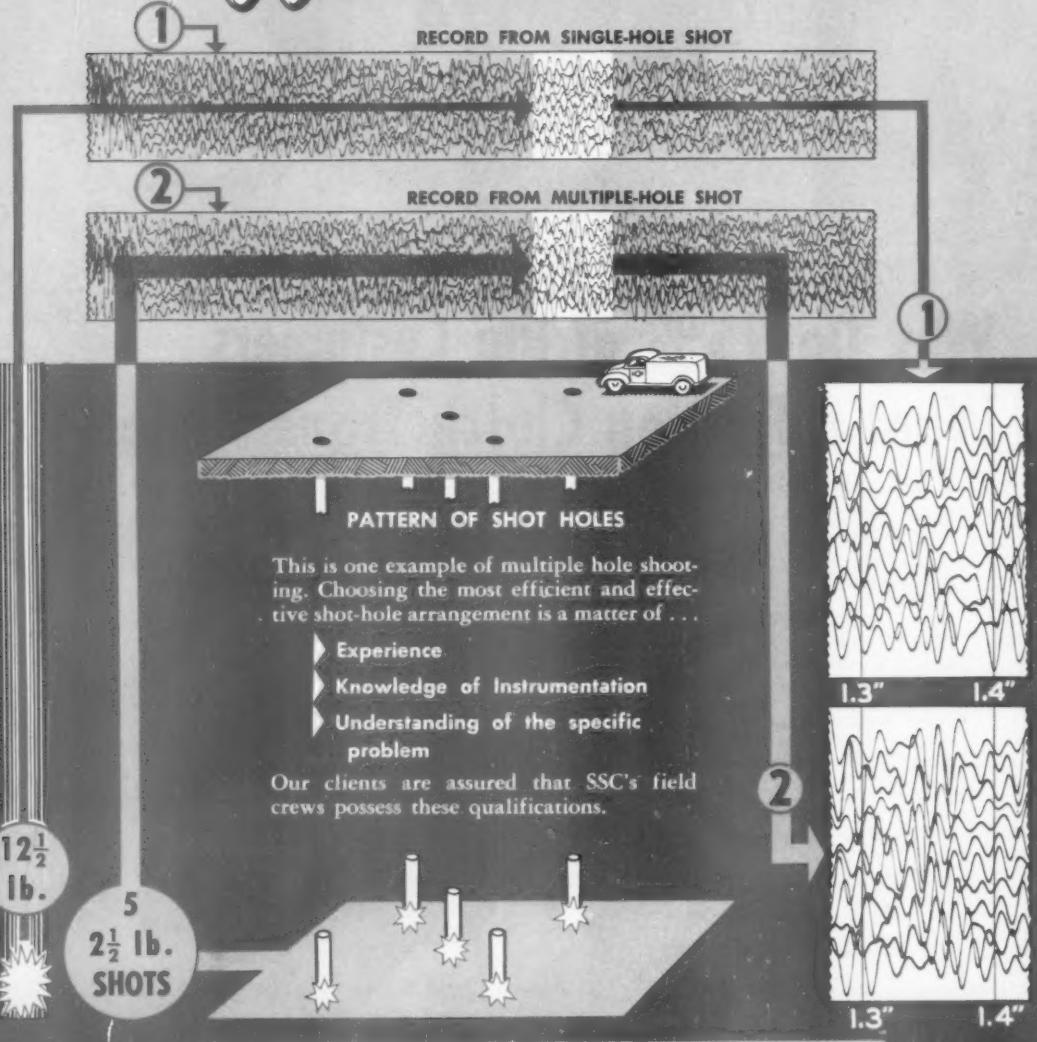
THE NEW WILSON ATLAS RIG FEATURES THE ALL FRICTION CLUTCH TRANSMISSION!

Wilson MANUFACTURING CO., Inc.

WICHITA FALLS, TEXAS

Basic Methods of Improving Seismic Records...

The Effect of MULTIPLE-HOLE SHOOTING



Seismograph Service Corporation

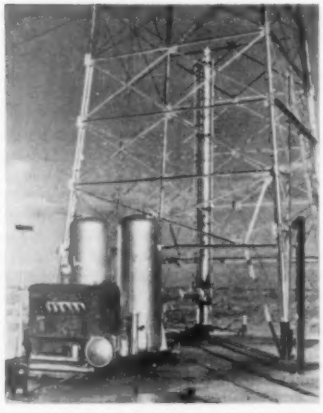
Seismic Surveys — Gravity Surveys — Pilot Crews — Lorac

TULSA 1, OKLAHOMA, U.S.A.

to Oil Well Supply Co. from Rev. F. H. Woodfield, in charge of the Methodist Mission at Roviana, New Georgia, British Solomon Islands:

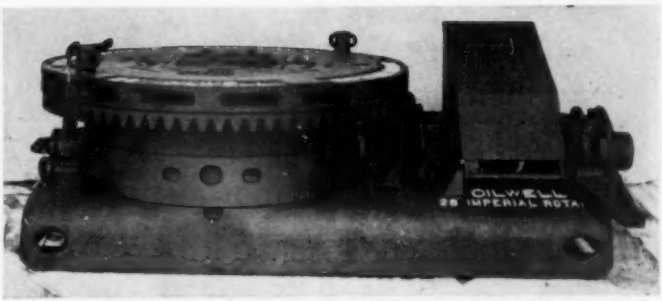
"I want to pay tribute to the endurance of your engines. The Dieselectric unit engine D4891 was discovered by natives of the Solomon Islands lying where it had been abandoned by the U. S. Forces in the jungle and its presence reported to me. When I recovered it, it had probably lain on its side in the jungle mud for at least 5 years. The engine was brought in to this station and cleaned up—a process that with disassembling and reassembling took not more than 8 hours as everything was so easily got at. After this a fuel tank was attached; fuel and water placed in their respective tanks and on the first attempt the engine started and ran perfectly. I think that it is a good recommendation for your engine that after such a period of total neglect in tropical conditions it should require no replacement parts to make it go again.

"We are, however, anxious to obtain the book for this engine, to get the maker's recommendations for running and overhaul; so if this is obtainable we would be pleased if you would send it to us. We were unfortunate in that we broke the flywheel locking nut when dismantling and as this is a left-hand thread we would be pleased if you could forward us another. The fuel line from the injector pump to the injector, even though still serviceable, is



Hydraulic Pumping

Oil Well Supply's research and development embrace progress in many lines. Here is shown a new experimental unit undergoing tests in a West Texas location.



MAKE-AND-BREAK feature of Imperial rotaries, introduced in the early 20's, was a noteworthy step in mechanized drilling operations which are today receiving so much attention.

In the American Tradition

PRESERVE YOUR FREEDOM!

We congratulate OIL WELL SUPPLY COMPANY on its foresight, 90 years ago, in recognizing the need for the development of machinery, equipment and tools for the infant oil industry . . . for its courage, faith, ability and sheer hard work in meeting this need . . . and for its continued progress in anticipating the expanding requirements of the industry. It has been a major contributor to the growth of a giant. And by meeting a need, it grew and expanded right along with the industry it serves.

Such growth is a perfect example of what can be accomplished when men are free to compete for jobs and customers . . . free to save and invest in their business or industry . . . and free to invent and improve and benefit from their work and risks. Let us thwart any attempt to undermine such incentives.

Use SPANG Weldless Jars for

- **Minimum footage costs**
- **Minimum fishing time loss**
- **Maximum strength, safety, durability, economy.**

The HIGHER STANDARD

SPANG CABLE TOOLS

made by SPANG & CO. BUTLER, PA.

for

OIL WELLS • GAS WELLS • ARTESIAN WELLS
SHOT BLAST HOLES • PROSPECT DRILLING

SPECIFY SPANG—FOR SALE BY DEALERS EVERYWHERE

Weatherproof

UNION'S
Complete Line of
WEATHERPROOF SOCKETS
Tops the Field for

Strength

(No. 63310 Canvas Reinforced)
(No. 43310 Extratuf—Paper Impregnated)

Convenience

(No. 43308 Pin Type)

Economy

(No. 43310 Bakelite and No. 43329 Rubber)

This explains why Union is Weatherproof Socket Headquarters, where more Pigtail and Pintype Sockets are made than all other manufacturers combined.

No. 43308 & 43318 Standard

INSIST ON THE BEST UNION!

No. 63310 CANVAS

No. 60666

No. 43310 EXTRATUF

No. 43329 RUBBER

Sockets

No. 43310

UNION INSULATING CO.
PARKERSBURG, WEST VIRGINIA

World's Largest Water-Flooding Plant

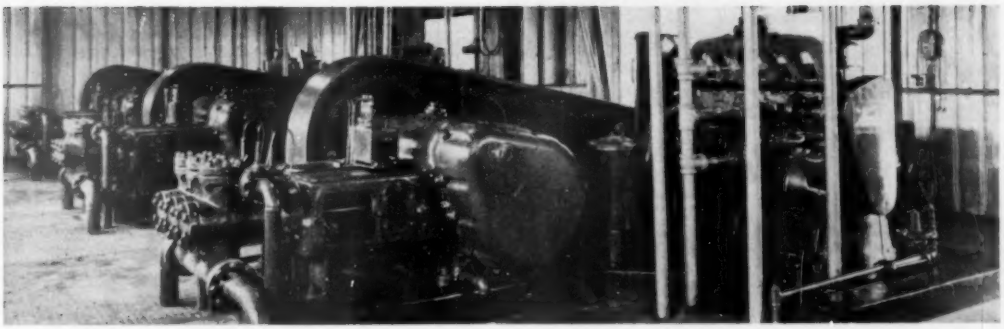
Here are outside and inside views of the largest of South Penn Oil Co.'s waterflood projects in the Bradford, Pa., field. "Oilwell" 46-P triplex pumps are employed.

showing signs of maltreatment, so if a spare could be sent us we consider that the engine will again be in absolutely first-class condition.

"The engine is being used to generate electricity to light one of our mission stations. At the same time it is connected to a sawbench to provide the necessary cut timber for the rehabilitation of our mission stations after their total devastation during the recent war."

Antarctic Mystery

WHILE the United States Navy was otherwise occupied during World War II, a secret expedition from an unknown country invaded its Antarctic base at Little America and either maliciously or through carelessness sabotaged some "Oilwell" equipment left there. Here's the story:



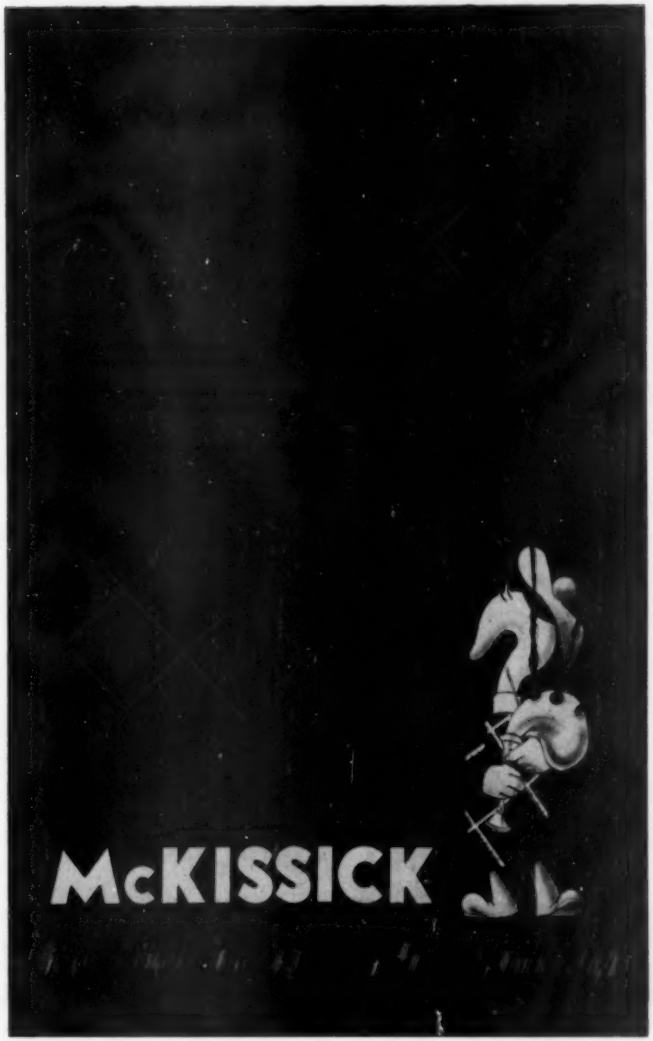
Deep Water Flooding In Southwest

Sunray Oil Co. has recently installed these "Oilwell" 336-P pumps, for water injection-pressure - maintenance service in Longville and East Longville fields of Louisiana.

When Adm. Richard E. Byrd left for the Antarctic late in 1939 with the United States Antarctic Service expedition, four Witte Dieselectric plants were taken along and placed in service at the two wintering bases. When the group returned to the United States in 1941 all units were checked and found to be in good condition. They were then prepared for years of idleness in the extremely low temperature of the region.

When Comdr. Fin Ronne returned to the Antarctic in 1949 at the head of the research expedition, he found that an unknown expedition had used the facilities at the east base without proper maintenance or proper processing of the camp before their departure and that the two Witte units which had been left (rated at 3 and 7½ kva. respectively) had been operated and badly damaged. The unknown operator had failed to drain the water from the cooling systems at the time of his departure and the radiator and blocks had been cracked by the ice that resulted. A supply of repair parts for the engines had also disappeared.

The Americans undertook to improvise the needed repair parts for the 9-hp. engine, which was the heart of the larger generator set. The cracked cylinder blocks were patched with copper sheeting and screws. Bent connecting rods were straightened and retempered. A crankshaft journal was reground in a 10-in. lathe, using a straight wet stone mounted in a jig. And a new governor shaft was turned out of cold rolled steel. After several unsuccessful attempts to pour and fit the babbitt



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bearing, a bronze sheet was machined to the connecting rod.

The 4-hp. engine was repaired by patching the cylinder block with copper sheeting and the cracked cylinder liner was a brass overlap ring held in place by brass screws. A new crankshaft was installed.

Both engines operated again with these improvised parts and the simplicity of the Witte engine design was highly praised in the expedition's reports.

First Supply Store Still a Going Concern

HOW'S this for a sign of permanence in an industry which is popularly consigned to oblivion every few years?

Not only is oil still being produced in the fields of western Pennsylvania where it was discovered nearly a century ago, but the world's first supply store is still doing a good business. It was opened in Oil City, Pa., in 1867 and became the foundation of the international business of Oil Well Supply.

Other "Oilwell" supply stores opened prior to 1906 and still operating are at Bradford and Washington, Pa.; Clarksburg and Parkersburg, W. Va.; Beaumont and Wichita Falls, Tex.; Los Angeles, Bakersfield, and Taft, Calif.; Bridgeport, Ill.

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and avoid costly delays in completing wells to the producing stage by preventing and controlling cavings, eliminating friction and wear on the wire line . . . and increasing the number of feet drilled per run . . . with

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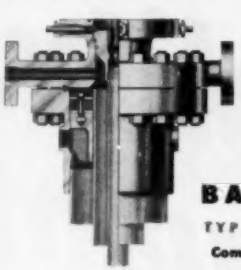


BAASH-ROSS

TYPE "UPS" HEADS

Combine Pack-Off And Slips In One Unit

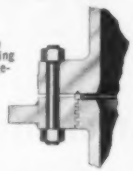
Type "UPS" Heads—a new Baash-Ross development—have the Packing Element and Slips unitized into a *single* hinged assembly that simply w-r-a-p-s around the casing and locks in place with one bolt. As the weight of the casing is placed on the slips, they *automatically* equalize themselves within the bowl to assure exact centering of the casing as well as a uniform grip around the *entire circumference* of the pipe. A few quick turns of a wrench then expands the packing element for a pressure-tight seal.

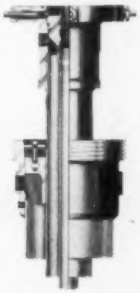
"UPS" ADVANTAGES INCLUDE . . . (1) No space wasted by threads, grooves or other packer-retaining devices—therefore overall height is reduced to a minimum . . . (2) Elimination of threads, grooves, etc., means a smooth bowl—nothing to become damaged during drilling operations, no need for protective sleeves . . . (3) Since all the slip segments are unitized together, none can set higher or lower than the rest—no risk of crimping the casing, no danger of an unequal grip that may fail in service . . . (4) Slips are set and packing is tightened around casing without stripping and without first cutting the casing. Simplifies installation—saves time!

"UPS" Heads also incorporate the unique Baash-Ross weld-testing feature which permits simultaneously testing the pressure-tightness of *both* casing welds with a gauge and hand pump as part of the installation procedure—or any time later. Any leaks discovered during the life of the well can be quickly sealed off by injecting plastic pack material.

"UPS" Equipment is available in a complete range of sizes . . . for threading or welding to the casing . . . with or without Bases . . . and for use with over a dozen different Tubing Heads Suspensions and Hook-Ups. *It is the ideal solution for a wide range of requirements on medium and low-pressure wells!*

View of Flange installed showing packing arrangement.





BAASH-ROSS

TYPE "UPS-DF" HEADS

Offer "UPS" Advantages Plus Demountable Flanges

Type "UPS-DF" Heads combine all the "UPS" advantages with an additional important feature—*Demountable Flanges that can be salvaged after the drilling operations for use on other installations.*

The body, packing and slips of this design are the same as standard "UPS" Heads to provide all the important "UPS" advantages outlined at left. However, the flange is attached to the main body by means of a square thread so that it can be readily removed when drilling operations are completed.

During drilling, the flange is installed on the Head to provide means for attaching standard pressure control. A unique packing arrangement—having important advantages over the conventional ring-groove design—prevents leakage between the flanges and is so placed that the square thread is not exposed to casing pressure.

After drilling is completed, the pressure control equipment is removed and the flange is unscrewed from the Head—an operation simplified by the easy make-and-break properties of the square thread. The flange, ring bolts and packing can then be used repeatedly on other wells, thus effecting important economies on multiple installations.

Available in a complete range of sizes and designs, Type "UPS-DF" equipment is the latest in a long string of Baash-Ross Landing and Casing Head advancements. *Be sure to investigate the economies this equipment can make for you!*

BAASH-ROSS

TYPE "X" HEADS

Provide Vital Advantages for High-Pressure Installations.

Developed several years ago to give new efficiencies on high-pressure wells, Type "X" equipment has been widely used on wells of all depths and pressures. It offers unusual simplicity, compactness and adaptability to different installation requirements, and the heavy-duty pack-off provides a dependable seal against the highest well pressures. The pack-off is made in a separate unit that fits between flanges—a pressure-tight seal being formed around the casing by a double-element Packing Assembly tightened by stud bolts.

TYPE "X" ADVANTAGES INCLUDE . . . (1) No grooves or threads in bowl to become damaged during drilling operations . . . (2) One-piece Packing Assembly mounts between flanges for maximum space saving . . . (3) Unitized Slips assure uniform slip pressure . . . (4) Packing Assembly and casing weld are so designed that seal around casing can be checked at any time during life of the well, and repaired with plastic material *without even breaking connections* . . . (5) Series ratings and flange sizes can be easily changed in the Head.

Type "X" Heads are available in a complete range of sizes, pressures and variations to meet every well requirement!

Baash-Ross Well Head Equipment is available through leading supply stores.

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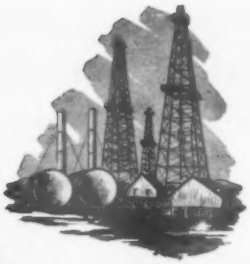
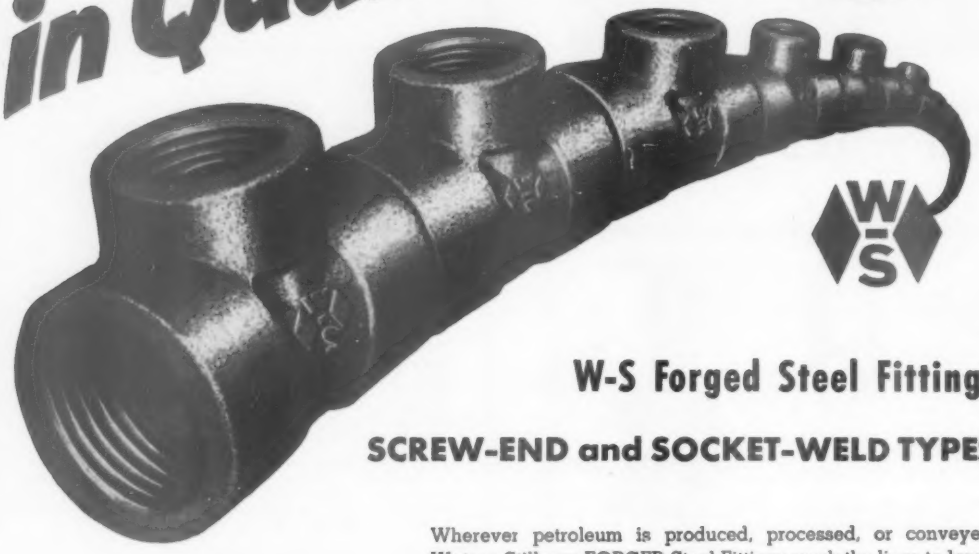
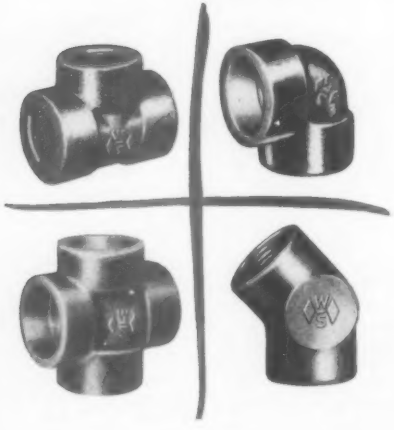




W-S Forged Steel Fittings

SCREW-END and SOCKET-WELD TYPES



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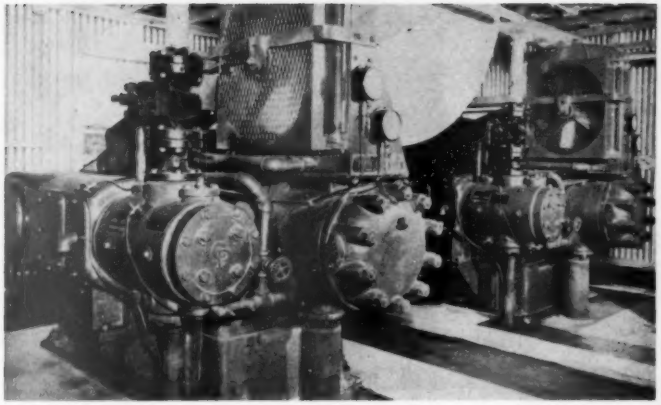
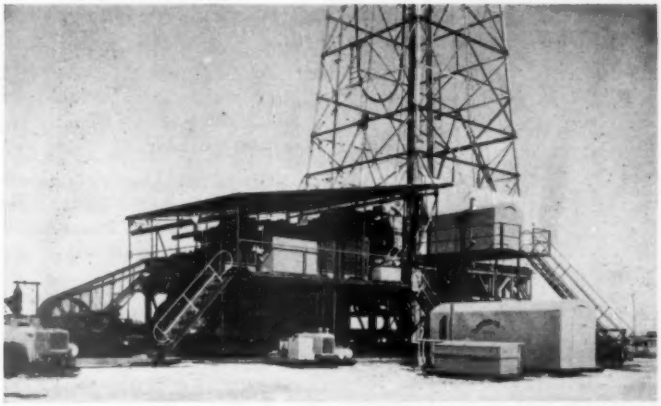
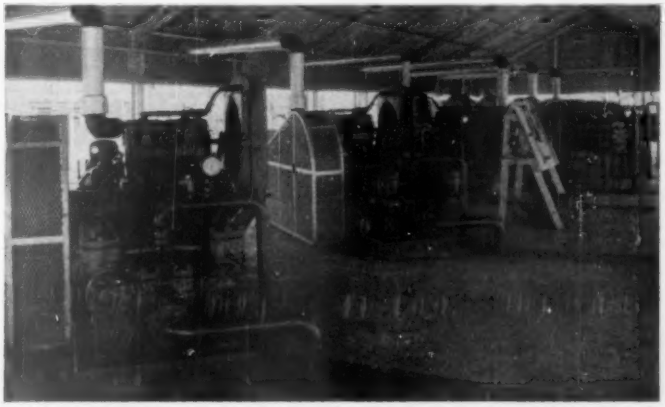


GAS REPRESSURING . . . These "Oilwell"-Lorain direct-connected compressor units recently have been installed by Kewanee Oil Co. for service in the West Pampa repressuring project, Texas Panhandle area.



DEEP-DRILLING JOB . . . Lawton Oil Corp. is here running its "Oilwell" Model 96 rig on a deep job northwest of Hobbs, N. M.



PUMPS IN NATURAL-GASOLINE PLANT . . . These Wilson-Snyder units are circulating lean oil at the natural-gas processing operation of Del Rey Petroleum Co., Chesterville, Tex.

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The INFERNO
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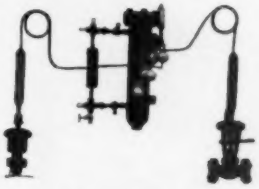

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The Inferno Boiler Safety Unit performs these functions:

1. Automatically controls water supply to maintain the proper level.
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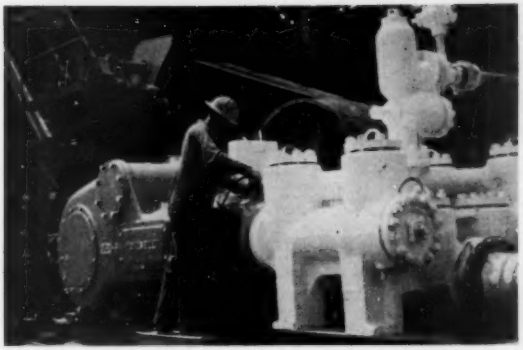
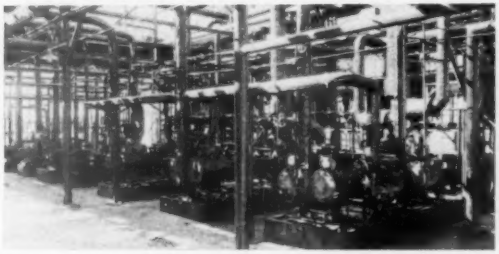
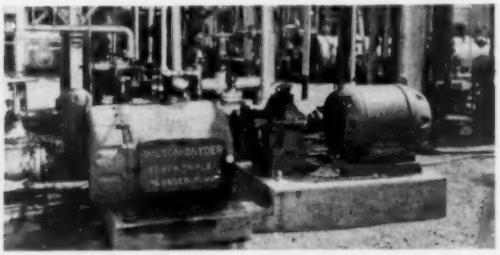


View of one of Oil Well's Wilson-Snyder 220-P power pump, a key part of Oil Well's largest drilling rig.



Wilson-Snyder duplex steam pumps; these particular units are located at Cities Service Refining Corp.'s plant, Lake Charles, La.



Wilson-Snyder pumps in refining operations. This photo taken at Cosden Petroleum Corp.'s refinery, Big Spring, Tex.

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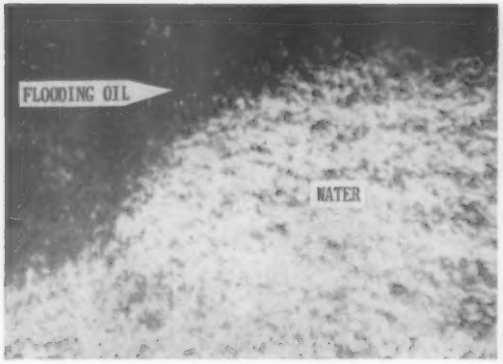
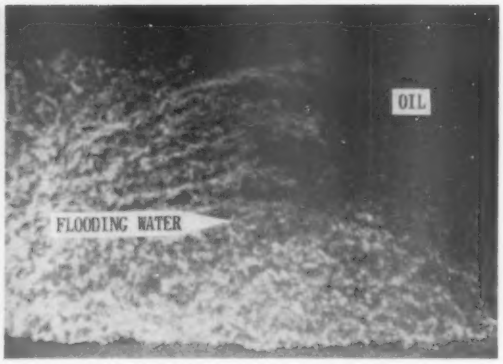
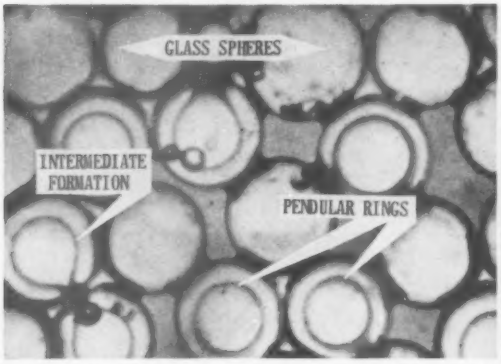


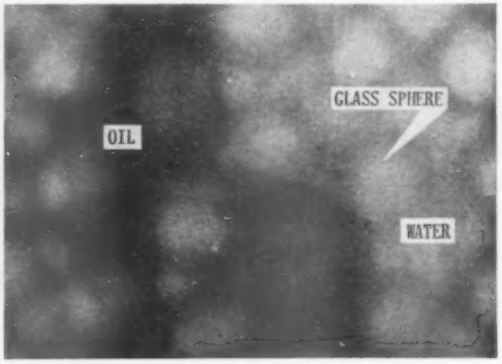
OIL DRIVING WATER.—Photomicrograph shows the pattern of the flood front that is set up when oil displaces water. Front is regular and even—effects displacement in a piston-like manner.



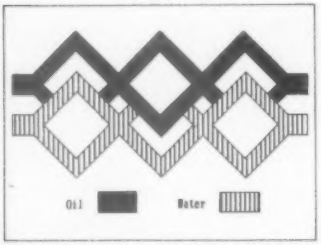
WATER DRIVING OIL.—Photomicrograph shows front set up when water displaces high-viscosity oil. Water moves through oil-bearing regions in a fingering action, leaving stringy oil formations.



WATER PATTERNS.—Photomicrograph shows residual formations of water in a water-wet glass matrix. The pendular rings, including most of the residual water, are quite apparent.



OIL PATTERNS.—Photomicrograph shows formations of residual oil in a water-wet glass matrix. It is apparent that these formations do not arrange themselves into pendular rings.



CHANNEL FLOW (diagrammatic).—Where this type of flow regime prevails, oil and water move through porous structures in their own respective, separate, continuous channel networks.

An Introduction to . . .

Flow of Oil and Water In Porous Media

by Alfred Chatenever*

THERE is a strong feeling in the field of petroleum technology that a little more knowledge about reservoir systems would bring about a significant increase in the production of our petroleum resources. This has encouraged the investment of considerable funds in reservoir-research activities. These have been continually increasing.

Much has been learned from highly developed production-research laboratories. Nevertheless, the engineer still feels a strong need for more knowledge to enable better predictions of field possibilities and behavior.

One experimental approach that has received attention only recently is that of studying the behavior of fluids in porous media on a microscopic level. This approach is being considered with much interest in the search for answers of practical significance.

Much of the early work in this field can be traced

*School of Petroleum Engineering, University of Oklahoma.

This article serves as an introduction to the use of microscopic studies in studying flow of immiscible fluids in porous media. The overall results of this work and their significance are explained here for the uninitiated in this field. The article immediately following by Chatenever, J. C. Calhoun, Jr., and D. A. Wilson describes an authoritative scientific study of this subject by the outhors. Results of painstaking investigations are quantitatively analyzed, and significant conclusions are developed.

to Pennsylvania State College and University of Oklahoma. Much effort has been devoted to visual observation of systems involving flowing immiscible fluids (such as oil and water) in porous structures. Special systems of transparent matrices with grains of microscopic dimensions have been fabricated to simulate reservoir formation. These permit observations right down to the pore level with considerable clarity. The flowing fluids are colored to give well-defined pictures of the physical behavior during flow.

Microscopic Examination

The idea of getting down into the pore to witness what is happening there is fascinating, and a number of questions immediately arise. For example: Does only the wetting phase touch the solid walls of the formation? Does one fluid flow within another? If not, can two liquids occupy the same pore? How is one fluid displaced by another? What is the nature of the residual formations of the wetting phase? What do the residual formations of the nonwetting phase look like?

These, and many more questions, have obvious significance to the practical engineer. Although the apparently crictical factors involved have familiar names, such as contact angle, surface tension, viscosity, etc., the hitherto developed methods and theories of chemistry, physics, and mathematics are altogether inadequate to offer definite solutions. The complexities of both the flowing system and the pore network within the solid matrix present problems presently beyond the scope of these three basic disciplines.

Certain aspects of the physical behavior of fluids in porous media have thus far been determined. One such phenomenon, known as "channel flow," has been observed where two liquids flow simultaneously through porous structures. Each liquid flows through its own separate and continuous network of interconnecting channels. When the flow is steady, the channels are fixed in geometry and position. With a change in flow conditions, a change in the channel structure occurs. Respective channels enlarge to accommodate that liquid flowing in greater proportion while the liquid flowing in smaller ratio found transport through channels of reduced dimensions.

Residual fluid formations have also been observed after flow stoppage. Wetting-phase residuals tend to occupy the pendular regions. They have been found frequently in the form of pendular rings. Residuals of the nonwetting phase tend to occupy the volumes between the grains. These have been found to vary in size from less than one grain diameter to several grain diameters.

Information has also been obtained about flood-front patterns. Fronts between displaced and displacing fluids may in some cases take patterns depending upon the ratio of the viscosities of these fluids. When oil of a high viscosity displaces water, a flood front which is even, regular, and piston-like in its displacement process may be set up. When water displaces oil of high viscosity, the water may tend to move through the oil-bearing regions in fingering dendritic patterns, leaving behind stringy formations of oil. Apparently, this displacement process is not as efficient as the former.

Although it is not possible to say on the basis of these studies that these are the phenomena that occur in natural reservoir processes, observations such as those indicated above nevertheless suggest possibilities for physical mechanisms in natural processes. With the extension of these investigations, some of which are already in progress, material of greater significance for engineering application will be obtained.

A Visual Examination of

Fluid Saturations in a Porous Medium

by David A. Wilson,* John C. Calhoun, Jr.,† and Alfred Chatenever*

NOT long after the first systematic investigations into the nature of fluid flow in porous media were undertaken, the microscopic mechanisms for the behavior of such systems gained serious attention.[1] It was realized that the microscopic picture not only would provide for a more complete understanding of the whole system but also was a necessary requirement for the development of pertinent analytical mathematical formulation.

With the accumulation of macroscopic data on this subject from the various petroleum production research laboratories over the past 18 years, the need for an understanding of microscopic mechanisms became more acute in that it might furnish explanations where none existed in such areas as relative permeability, displacement phenomena, residual fluid formations, etc.

Microscopic Studies

Until recently, microscopic mechanisms have been considered almost exclusively as speculative hypotheses. Within the past few years, however, the problem has been submitted to a limited number of experimental attacks. Nuss and Whiting[2] made some studies on pore-space geometry in sandstones and limestones by impregnating cores with an inert plastic and leaching the sand matrix to leave behind plastic models of the pore spaces. Schaefer[3] traced pore spaces in limestone through a length of core by cutting away thin sections from the exposed face. Calhoun and Chatenever[4] made some microscopic studies of dynamic fluid phenomena in synthetic porous matrices by visual observations and moving-picture studies. Lowman[5] observed heterogeneous dynamic fluid flow phenomena microscopically in capillaries.

The American Petroleum Institute Research Project 47B is concerned with the investigation of microscopic mechanisms and the present work is

*School of Petroleum Engineering, University of Oklahoma, and †chief, Division of Petroleum and Natural Gas Engineering, Pennsylvania State College.

one of the studies involved. Previous studies in the project had been carried out mostly in porous matrices of one or two layers, and it was important to verify some of the observations "in depth" such as in cylindrical cores. This necessitated the development of appropriate experimental techniques such as making a solid cast of flow structure. In this way observations could be made in three dimensions rather than the two that the microscope is limited to and a permanent record could be achieved.

Among the several flow phenomena that have been observed by Calhoun and Chatenever[4] in their thin matrices, two appeared to be subject to examination with the present techniques. Those two phenomena have been called "channel flow" and "lucite layer."

Channel flow.—This is a flow regime characteristic of the simultaneous flow of two immiscible liquids through a porous medium wherein for a steady state each fluid effects transport through its own stable network of channels. The channels are bounded by liquid-liquid as well as liquid-solid interfaces.

Lucite layer.—In the phenomenon of the lucite layer it was observed that in a flow bed bounded on one side by a lucite plate, the oil phase in a water-oil flow system tended to preferentially wet the lucite. It was thought possible, too, that with the attainment of solidified flow structures another method for studying saturation distributions might be made available.

In general, the present study involves preparing water-soluble cores, saturating with two liquids of which one is solidifiable and water-insoluble, and leaching the core with water to dissolve the core matrix and the unsolidifiable liquid leaving behind the solid flow structure of the other.

Technique and Procedure

Sodium chloride was consolidated within lucite cylinders under pressure and temperature by a technique similar to that for mounting core specimens. Table salt of crystals measuring about 0.5 mm. on an edge was packed into a lucite sleeve (5 cm. long, 3.8 cm. outside diameter and 2.3 cm. inside diameter); and the combination was pressed in a 3.8-cm. mold at 100° C. and under 2,500 psig.

Inasmuch as the salt crystals were cubic in geometry, the resulting porous structure could be seen to have many sharp edges. After molding under pressure, the salt pack was firmly consolidated and could be handled in a manner similar to an oil-field core. So that the fluids would be properly transmitted through the test core according to the Penn State technique[5] for determining relative permeability, inlet and outlet sections were made for assembly with the test section in a flow apparatus as shown in Fig. 1.

The outlet section was always reduced in cross-sectional area. The inlet section was used in different arrangements: with no orifice, with one orifice, and with an assemblage of orifices as appears in the photograph. Fig. 2 is a flow diagram for all of the equipment involved. A is the test assembly, C and D the fluid reservoirs, E the efflux reservoirs, F vents, G level of thermostatically controlled bath, H inlet pressure gage, and B needle valves.

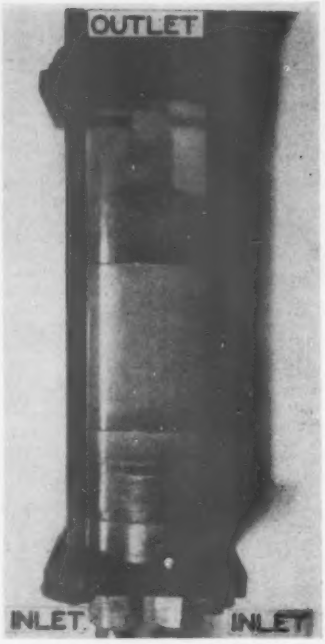


Fig. 1—TEST SECTION for flow measurements through salt core.

Permeabilities were measured on each test section by flowing kerosine. Porosities were determined by weighing the amount of kerosine required to saturate a core after it had been evacuated. Table 1 includes a listing of the porosities and permeabilities of the various test cores that were used.

TABLE 1—POROSITY, PERMEABILITY, AND SATURATION DATA

Core number	Porosity (per cent)	Permeability darcies	Paraffin saturation during flow (per cent)
VI	27.3	14.0	*44.7
IX	23.0	19.2	*9.2
X	23.6	12.5	[illegible]
XII	23.6	13.4	13.0
II'	25.0	10.7	36.5
III'	23.6	10.3	22.9
VI'	25.2	15.9	37.5
X'	23.6	7.3	28.7
2	23.2	11.5	18.5
6	23.4	12.5	†26.7
7	24.7	17.5	25.0

*Displacement test. †Horizontal run.

TABLE 2—LIQUID PROPERTIES

Liquid—	Density (cms./cc.)	Visc. (cp.)	Temp. (°F.)
Kerosine	0.792	1.78	85
Glycerin	1.[illegible]5	52.51	137
Paraffin	0.785	6.09	137

Glycerin-paraffin interfacial tension at 137° F. was about 14 dynes per centimeter.

The properties of the flowing phases are given in Table 2. All the runs were carried out at 137° F. at which temperature the paraffin was liquid. Although the glycerin was higher in density than the paraffin, the viscosity of the former was approximately eight times the latter, a situation in reverse to the usual natural conditions when considering paraffin and glycerin analogous to oil and water respectively.

The ratio of permeability to aqueous phase viscosity was in the range 140 to 400 md. per centipoise and the ratio of permeability to hydrocarbon phase viscosity in the range 1,000 to 3,000 md. per centipoise.

The preferential wetting of the salt

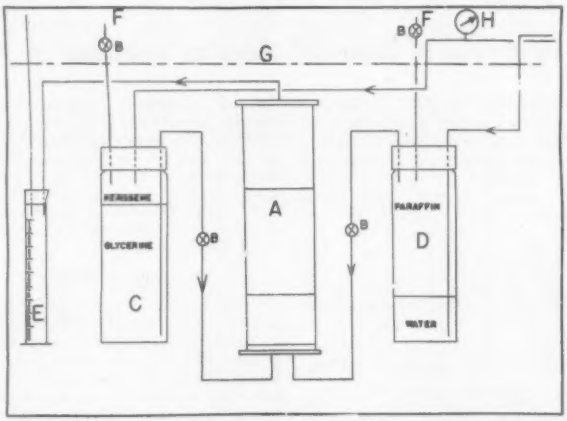


Fig. 2—FLOW DIAGRAM for equipment used in flow measurements.

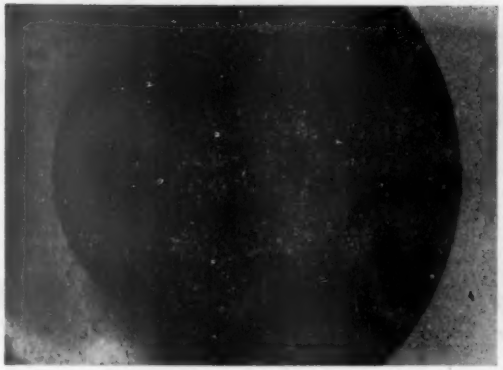


Fig. 3—End of core No. IX.

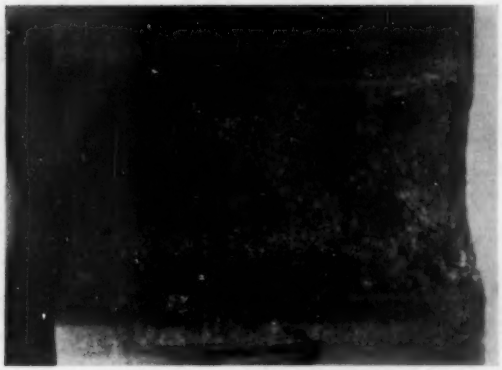


Fig. 4—Cutaway view of core No. IX.

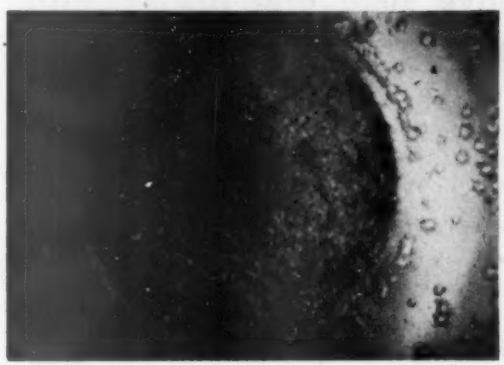


Fig. 5—End of core No. III'.

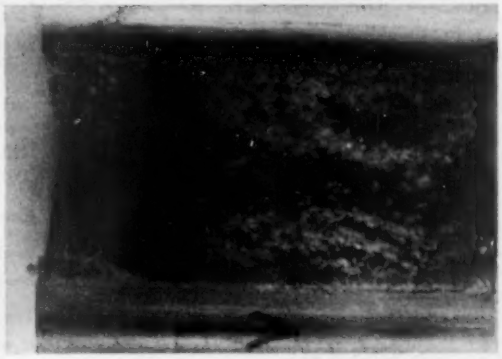


Fig. 6—Cutaway view of core No. III'.

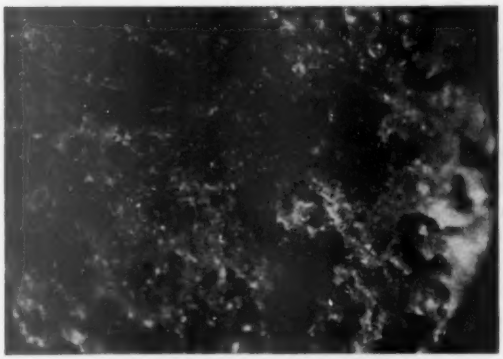


Fig. 7—Paraffin network of core No. III'.

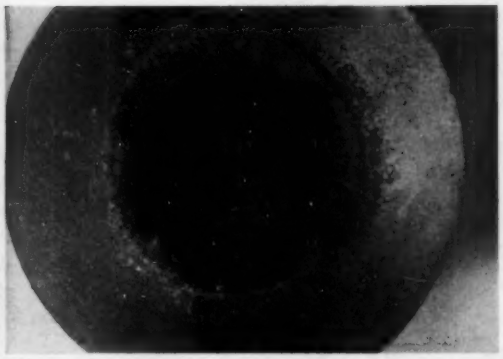


Fig. 8—End of core No. 6.

by the glycerin was definitely indicated when a paraffin-saturated salt core was placed in glycerin where the paraffin was spontaneously displaced by the glycerin.

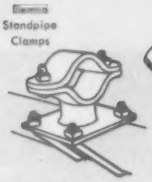
In procedure, the test specimens after molding were saturated with kerosine for porosity and permeability determinations, flushed with gasoline, then with air and finally evacuated. All except one (Core VI) were saturated initially with melted paraffin for the test runs. Core VI was saturated first with glycerin for the purpose of obtaining residual glycerin after paraffin displacement.

Prior to a test run, the end assembly pieces were also saturated with liquid paraffin and the test section was assembled with the end pieces as indicated in the figure. All runs were made in a water bath, thermostatically controlled.

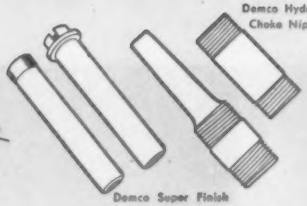
As indicated in the flow diagram, the paraffin was displaced from its storage reservoir by water and the glycerin was displaced from its storage reservoir by kerosine. These displacing fluids were easily handled by the positive-displacement pumps used for the prime actuation. These were of the Stanolind type.[7] The test section was held in a vertical position during a run unless otherwise indicated.

In assembling the two end sections

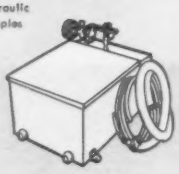
Demco Auto-Flo Mud Hopper



Demco Standpipe Clamps



Demco Super Finish Wash Pipes

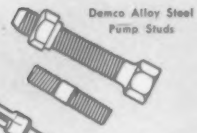


Demco Hydraulic Choke Nipples

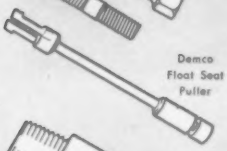
Demco Rod Oiler

Demco Hydraulic Hose Adapters

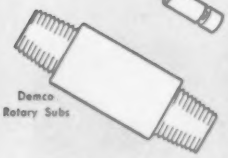
Demco Hose Hobbles



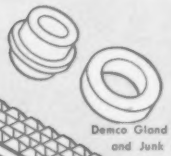
Demco Alloy Steel Pump Studs



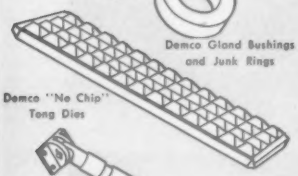
Demco Float Seat Puller



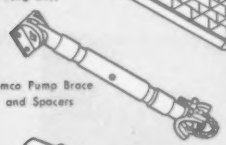
Demco Rotary Subs



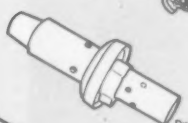
Demco Gland Bushings and Junk Rings



Demco "No Chip" Tong Dies



Demco Pump Brace and Spacers



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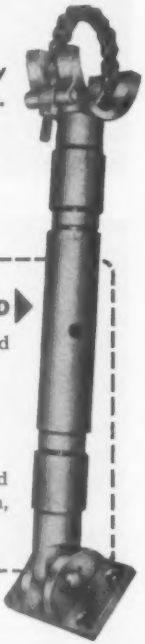

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Fig. 9—Cutaway view of core No. 6.

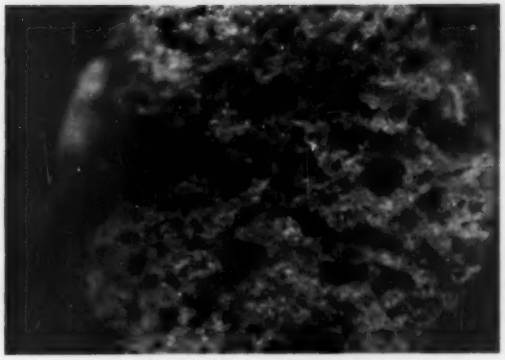

Fig. 10—Paraffin network of core No. 6.

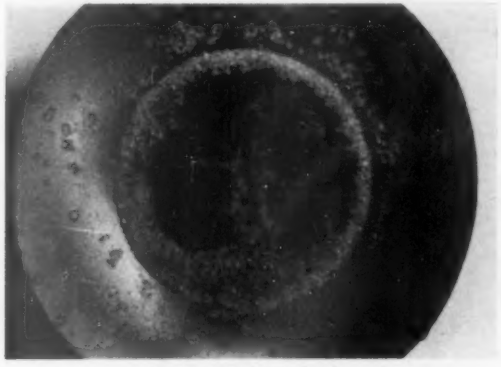

Fig. 11—End of core No. X.

Fig. 12—Cutaway of core No. X.

Fig. 13—Paraffin network of core No. X.

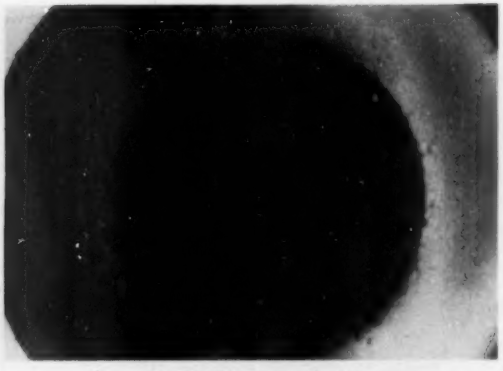

Fig. 14—End of core No. VI.

and test section together for a run, the contact faces of the salt sections were left flush with the lucite molding rather than providing for any undercutting. A good leaktight seal was obtained by compressing the assembly with screws.

The rates of flow during the tests were maintained so that the total was always approximately 0.3 and 0.4 cc. per minute. A ratio of flow was established and continued until it was estimated that equilibrium flow conditions had been achieved. Time to attain equilibrium varied from 2 to 3 hours. The criterion for equilibrium was taken to be constancy of the inlet pressure measured on the kerosine inlet line leading to the test assembly. Further check was accomplished by comparing the measured inlet and efflux volumes for both the paraffin and the glycerin.

Saturation at equilibrium flow conditions was determined by weighing the test section immediately after removing it from the flow system. Immediately after weighing, the test section was placed in an ice box for hardening of the paraffin.

To remove the glycerin phase and dissolve the salt matrix, the test specimen was first subjected to water un-

Fig. 15—Cutaway view of core No. VI.

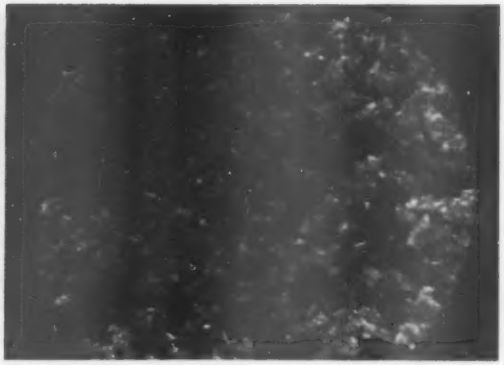

Fig. 16—Paraffin network of core No. VI.

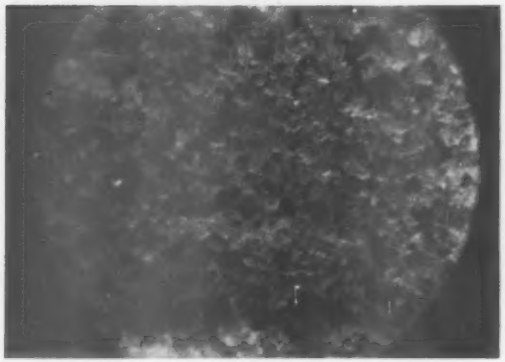

Fig. 17—A paraffin cast of the porosity pattern of a salt core.

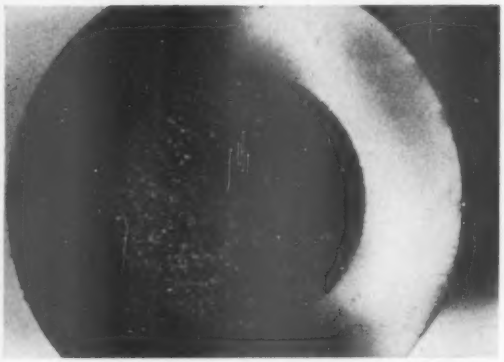

Fig. 18—Inlet end of core run without orifice.

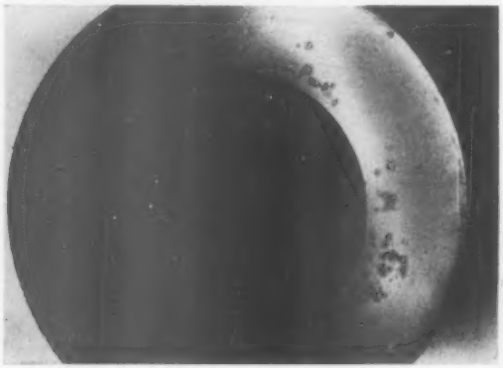

Fig. 19—Outlet end of core (same as Fig. 18) run without orifice.

Fig. 20—Paraffin particles from core No. 2.

der about 10-psig. driving pressure. This was to effect a rapid initial displacement of glycerin and provide a solution channel for the water. Water was then permitted to drip slowly and seep through the core. The effluent was filtered through filter paper in order to catch any small pieces of loose paraffin.

Results

The measured saturation value for each of the test sections when removed for observation is recorded in Table 1. Two of these listings are displacement tests (only the displacing phase being pumped). The remainder are steady-state, two-phase flow tests.

Typical photographic results are given in Figs. 3 through 17. These illustrations are arranged so as to present the remaining paraffin flow structure in cross-section, longitudinal section, and microscopic view for some of the cores in increasing order of paraffin saturation. Fig. 17 is a

(*Continued on page 204*)

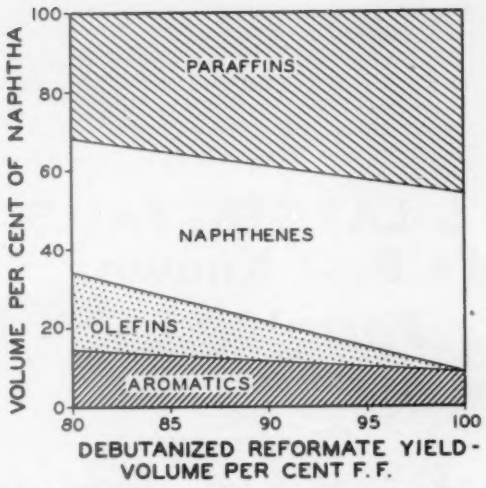

Fig. 1—Composition of thermal reformate, East Texas naphtha.

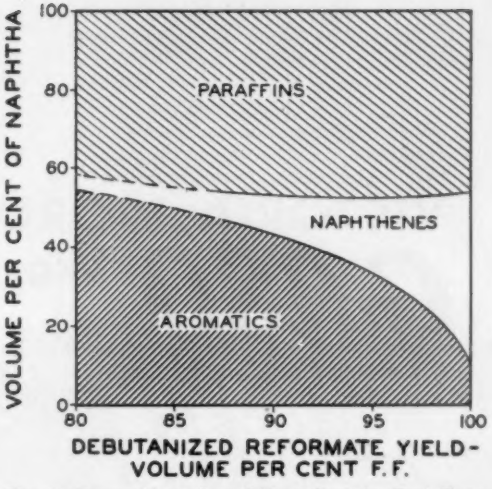

Fig. 2—Composition of catalytic reformate, East Texas naphtha.

In REFORMING it's the CATALYST that counts

What is a good reforming catalyst? It must have selectivity, it must have stability, and it must have stamina, these authors declare.

by M. J. Fowle,* R. D. Bent,* B. E. Milner,* and G. P. Masologites*

THE increased octane requirements of today's motor cars have presented every refiner, large and small, with the immediate challenge of providing fuels for the present and future automobiles. The refining industry has made considerable progress in keeping pace with the increasing octane demand since the end of World War II by the installation of a large volume of catalyst cracking capacity. There is a definite limitation, however, in the ability of catalytic cracking to raise the octane level of the whole refinery gasoline pool. The principal reason for this is the high percentage of straightrun and natural gasolines of relatively low octane which must be blended into motor fuels.

Thermal reforming of these materials has been practiced for many years in some refineries with the express purpose of upgrading octanes. It is well recognized, however, that by virtue of the uncontrolled reactions taking place in thermal reforming, this method of octane improvement is both costly and limited in potential octane ceiling. The change in chemical composition of a thermally reformed naphtha with increasing reforming severity is illustrated in Fig.

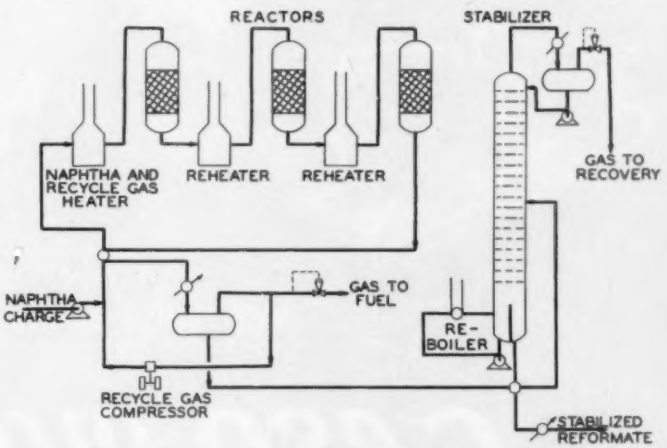

Fig. 3—Flow arrangement of Atlantic's reforming process.

*Atlantic Refining Co. Paper presented at annual meeting of Western Petroleum Refiners Association, San Antonio.

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1. It will be seen that, in this case, octane improvement is realized primarily by the cracking of paraffins to olefins with a relatively minor change in the aromatic and naphthene content.

With this as a background, a number of catalytic reforming processes[1,2] have been developed over the past few years to satisfy the demand for higher octanes from straightrun and natural-gasoline sources. Catalytic reforming accomplishes this economically by controlling the chemical reactions which take place. As contrasted to thermal reforming, the Atlantic catalytic reforming process accomplishes octane improvement by the isomerization of paraffins and naphthenes and the conversion of naphthenes to aromatics as shown in Fig. 2. Olefins are not produced. Of prime importance is the fact that these reactions result in a high liquid recovery of finished reformate.

Catalyst properties.—The most important and distinguishing feature of any catalytic reforming process is the catalyst itself; for this, to a major extent, influences the daily operating economics of the process and the complexity of the processing equipment required to carry it out. What are the important characteristics of a reforming catalyst? One is selectivity—the ability of the catalyst to promote the desired reactions of dehydrogenation and isomerization while controlling cracking. A second property is stability—will the catalyst maintain the desired yield-octane relationships over an extended life? Another "must" feature of a reforming catalyst is stamina—the ability of the catalyst to perform satisfactorily under the many varied conditions encountered in normal refinery operations.

Process and Equipment

To illustrate the role of the catalyst in obtaining the desired reforming results with minimum capital and operating expenditures, the Atlantic catalytic reforming process is here described. The Atlantic process is a continuous, normally nonregenerative process utilizing multiple fixed-bed reactors. A schematic process flow diagram is shown in Fig. 3. The feed naphtha, direct from tankage, is joined with a recycle hydrogen stream. The mixture is heated to operating temperature by reactor effluent-feed exchange and a furnace before passing to the reactor section. Two or three reactors are utilized to accomplish the completed reaction at the desired temperature level. Since the catalytic reforming reaction is predominantly endothermic, reheaters are employed between reactors to bring naphtha-hydrogen mixture back to the operating temperature. The final reactor effluent, after exchange with feed, is cooled and passes to the gas separator. The recycle hydrogen stream is compressed and returned to the reactor while the net production is sent to fuel or other uses. Gas separator liquid is charged to a conventional fractionating tower for stabilization. Typical operating conditions for reforming an East Texas straightrun naphtha are shown in Table 1, while Table 2 lists utility requirements for a 10,000-bbl. per day refoming operation.

TABLE 1—ATLANTIC CATALYTIC REFORMING PROCESS. TYPICAL OPERATING CONDITIONS. EAST TEXAS STRAIGHTRUN NAPHTHA

Naphtha feed: boiling range, °F.	175-375
Space velocity: lb./hr. naphtha feed/lb. catalyst	3.0
Reactor pressure, psi.	500
Reactor inlet temperature, °F.	920
Recycle: Mol recycle gas/mol. naphtha charge	10/1
Recycle gas: Mol per cent hydrogen	95
Temp. drop across reactors, °F.:	
1st	100
2nd	50
3rd	20

TABLE 2—ATLANTIC CATALYTIC REFORMING PROCESS. UTILITY REQUIREMENTS

Basis: East Texas type straightrun naphtha—	10,000 BPD unit
Reactor furnaces, delivered duty, MM. B.t.u./hr.	57
Stabilizer reboiler, 400 lb. steam, lb./hr.	18,000
Recycle gas compression requirement, b.hp.	1,650
Power requirements: Pumps, fans, etc., kw.	450
Cooling-water makeup, g.p.m.	175

Process advantages.—The simplicity of the process is emphasized by the absence of any feed-preparation facilities or costly catalyst regeneration equipment. In addition, the stabilized reformate is of such quality that no naphtha treatment is required before blending the product into finished gasoline. Under normal operating conditions, for motor-fuel production, carbon laydown on the catalyst is negligible. If, however, regeneration of the catalyst should be required, this may be accomplished, in place, by passing a dilute air-in-steam mixture over the catalyst. When charging high-sulfur stocks, it is desirable and practical to minimize the sulfur content of the reactor feed. In the Atlantic process, this is accomplished by a simple desulfurization of the recycle hydrogen stream (such as in a conventional amine unit).

Because of the simplicity of the equipment required for the process it is equally applicable to large or small units. Units are currently being constructed in sizes ranging from 750 to 12,000-bbl. per day charge capacity. Investment costs range from $350 to $450 per barrel of naphtha charge.

Pilot plant development.—The Atlantic catalyst reforming process is the result of several years of intensive development work in our own laboratories and in those of Davison Chemical Corp., one of the nation's leading catalyst manufacturers. A previous paper by Fowle et al[3] has reviewed the development of this reforming catalyst. A 6-bbl. per day continuous pilot plant has been in operation for nearly 2 years evaluating a wide variety of potential feed stocks and catalyst preparations. The basic flow diagram of this pilot plant is essentially similar to the commercial units currently being designed and constructed.

Catalyst Performance

Typical pilot-plant results from a variety of feed stocks are shown in Tables 3 and 4. Analysis of these data will show the outstanding characteristics of the Atlantic catalyst in obtaining and maintaining yield-octane relationship. Such results can be obtained only by a selective catalyst which maximizes dehydrogenation of naphthenes and isomerization of paraffins and naphthenes while controlling the undesirable cracking reactions. This is emphasized by the yield

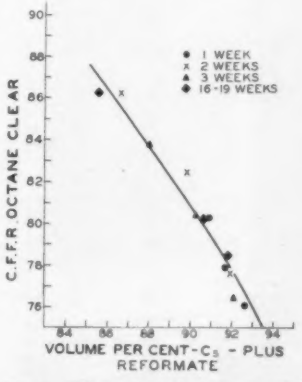

Fig. 4—Effect of catalyst age on yield-octane relationship. East Texas naphtha.

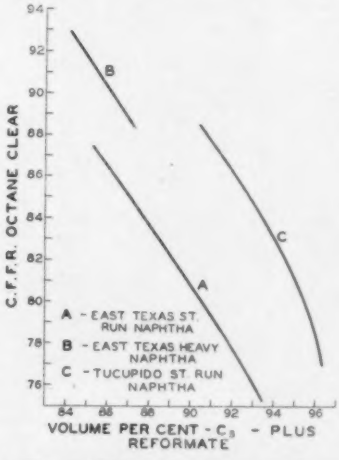

Fig. 5—Effect of charge stock on yield-octane relationship. Atlantic cat process.

and quality data in Table 3. It will be seen that the yields of methane plus ethane are consistently below 1 wt. per cent of feed and that the purity of the recycle hydrogen stream runs approximately 95 mol per cent hydrogen. This, incidentally, suggests utility other than fuel for the hydrogen make gas. Further evidence of the selectivity of this process is shown by the high liquid recovery of propane and heavier which for the wide range of feed stocks and reforming severities illustrated runs from 96.8 to 101.7 vol. per cent of fresh feed. This is particularly significant in many refinery locations where fuel gas is of little economic or material value.

Catalyst stability.—While it is of great importance to have a catalyst which produces high yield-octane values when relatively new, the stability of the catalyst in maintaining these results is a major factor in determining the economics of the process. This important feature was studied in a recent 5-month run on a batch of Atlantic catalyst in the pilot plant. A standard, wide-cut, East Texas-type naphtha was charged to the unit at intervals over the length of the run. These test data are shown in **Fig. 4**, in which it will be seen that there was no change in the yield-octane relationship over the entire period. Data from two of these test periods are listed in column 1 of Table 3, together with the properties of the feed stock used in this column. Evaluation of this batch of catalyst was discontinued while operation was still entirely satisfactory at a catalyst life of 30 bbl. of feed per pound of catalyst.

The danger of generalizing on the yield-octane results from various feed stocks is emphasized by reference to Fig. 5 and Table 3. Curve A is the data previously referred to for a wide-cut but East Texas-type naphtha. The effect of width of boiling range is shown by comparison of curves A and B where it will be seen that, although the narrow boiling stock (column 2, Table 3) had a 3.4 lower octane, the debutanized reformate was three points higher at the same yield. Data from Tucupido, an aromatic Venezuelan naphtha, are illustrated in curve C, showing the effect of chemical composition on final yield octane results.

It has been stated that under normal operating conditions for motor-fuel production carbon deposition on the catalyst is negligible. Under very severe reforming conditions or in the case of a major unit upset, however, carbon may be formed on the catalyst, reducing its activity. With the Atlantic catalyst this condition may be corrected by a simple regeneration operation, in place, using a dilute air-in-steam mixture to burn off the carbon deposit. This is an important fea-

TABLE 4—CATALYTIC REFORMING OF NATURAL GASOLINES

Charge material—	North Texas	South Texas
Charge:		
A.P.I.	68.1	67.4
R.v.p.	4.7	5.3
A.S.T.M.:		
0	136	114
10	158	140
50	201	194
90	293	282
E.p.	362	351
Sulfur, wt. %	.001	.003
Res. octane:		
0 cc.	49.7	64.4
3 cc.		83.7
Paraffins, vol. %	77.6	62.4
Naphthenes, vol. %	14.0	30.3
Aromatics, vol. %	8.4	7.3
Yields, % of feed:		
C_5 plus, vol. %	87.5 79.0	81.2
C_4, vol. %	9.3 15.5	11.4
C_3, vol. %	4.6 9.0	8.3
C_3 plus, vol. %	101.4 103.5	100.9
H_2, wt. %	0.50 0.50	1.20
C_1, wt. %	0.15 0.60	0.34
C_2, wt. %	0.30 0.89	0.68
10 lb. R.v.p. naphtha, vol. %	93.7 82.6	83.5
Excess C_4, vol. %	3.1 11.9	9.1
Product quality:		
C_5 plus res. oct.:		
0 cc.	73.9 80.5	88.5
3 cc.	90.3 93.7	98.4
10-lb. naph., res. oct:		
0 cc.	75.2 81.0	83.5
C_5 plus naph., 3 cc.	91.0 93.9	88.6
A.P.I.	68.4 67.8	62.9
R.v.p.	5.9 7.3	8.3
A.S.T.M.:		
0	115 113	116
10	136 122	125
50	178 160	170
90	264 285	300
E.p.	334 337	360
Sulfur, wt. %	Nil Nil	.001

TABLE 3—CATALYTIC REFORMING OF STRAIGHTRUN NAPHTHAS

Feed stock No.—	(1)		(2)		(3)	(4)		(5)	(6)	(7)	(8)	(9)
Crude source—	East Texas		East Texas		West Texas	Oficina		Mid-Continent	Calif.	Tucupido	Gulf Coast	Gulf Coast
Charge:												
A.P.I.	56.5		54.6		51.6	51.5		47.9	46.9	50.3	50.2	53.1
R.v.p.	0.8		0.3		0.1	0.5		0	0	0.8	0.2	0
A.S.T.M.:												
0	181		218		228	242		317	284	232	268	196
10	211		236		247	259		324	295	250	282	226
50	255		268		281	279		336	309	274	306	280
90	320		317		346	318		356	338	312	355	350
E.p.	370		365		406	348		401	360	374	396	382
Sulfur, wt. per cent	.005		.005		.092	.013		.002	.14	.003	.047	.002
Res. octane:												
0 cc.	54.9		51.5		51.2	56.9		36.0	60.2	60.3	46.5	47.4
3 cc.					70.0			63.1	76.1		66.9	73.9
Paraffins, vol. per cent	43.2		42.1		40.5	42.6		48.2	27.4	39.5	46.8	49.2
Naphthenes, vol. per cent	47.6		46.7		38.7	36.5		36.1	59.6	32.5	36.4	34.0
Aromatics, vol. per cent	9.2		11.3		20.8	20.9		15.7	13.0	28.0	16.8	16.8
Yields, per cent of feed:												
C_5 plus, vol. per cent	90.9	86.7	84.4	86.7	89.2	91.0	88.9	89.5	88.4	93.1	85.2	87.4
C_4, vol. per cent	3.9	7.5	8.2	6.3	7.7	4.8	6.4	5.5	4.1	3.0	11.8	8.6
C_3, vol. per cent	2.3	3.7	5.1	3.8	3.0	2.9	3.9	5.4	3.7	2.5	4.7	4.9
C_3 plus, vol. per cent	97.1	97.9	97.7	96.8	99.9	98.7	99.2	100.4	96.2	98.6	101.7	100.9
H_2, wt. per cent	1.57	1.78	1.90	1.91	1.20	1.18	1.31	1.11	1.57	1.14	1.07	1.34
C_1, wt. per cent	.17	.27	.17	.12	.31	.08	.16	.21	.27	.09	.13	.23
C_2, wt. per cent	.20	.37	.43	.30	.34	.15	.28	.45	.51	.14	.42	.52
10-lb. R.v.p. naphtha, vol. %	103.1	96.8	96.2	99.7	102.3	103.7	100.0	102.1	101.5	107.4	96.5	100.6
Excess C_4's, vol. per cent	—8.3	—2.6	—3.6	—6.7	—5.4	—7.9	—4.7	—7.1	—7.4	—11.4	0.5	—4.6
Product quality:												
C_5 plus—res. oct.:												
0 cc.	80.3	86.2	92.6	89.2	81.0	83.4	88.5	83.0	91.6	84.8	86.2	82.2
3 cc.	93.0	97.1	98.9	97.3	92.9	94.4	98.1	94.1	99.6	94.6	96.3	94.4
10-lb. naphtha res.:												
0 cc.	82.0	87.2	92.9	89.7	82.8	84.8	89.2	84.5	92.0	86.2	87.2	83.8
3 cc.	94.0	97.6	99.1	97.9	94.0	95.3	98.5	95.0	99.8	95.5	96.9	95.2
C_5 plus naphtha:												
A.P.I.	52.2	50.5	47.8	47.8	50.2	48.1	48.2	46.1	43.1	47.2	47.7	49.7
R.v.p.	2.6	3.1	2.3	1.8	1.9	2.3	3.0	2.2	4.0	1.6	2.7	1.7
A.S.T.M.:												
0	162	134	126	132	114	120	112	114	114	137	122	128
10	192	179	187	201	203	221	198	197	237	220	191	184
50	244	240	258	261	265	278	278	322	314	270	282	252
90	319	324	323	329	342	324	332	368	357	313	341	338
E.p.	393	394	380	389	408	394	383	442	421	387	425	418
Sulfur, wt. per cent	.001	.001	.001	.001	.002	.001	.001	.001	.001	.001	.001	.001
Hydrogen purity, mol per cent at 500 psi. 95° F.	95.8	94.7	96.4	98.0	92.2	97.0	95.5	93.0	94.9	96 5	95.5	95.2

ture of the process since it eliminates the need for expensive regeneration facilities in the plant and greatly extends the useful life of the catalyst.

The fact that this catalyst can be regenerated by air and steam brings out another significant characteristic; namely, that water has no harmful effect on the catalyst. This is important both from the standpoint of catalyst regeneration and the fact that it is unnecessary to provide facilities for elimination of water from the feed in normal refinery operations. During the above-mentioned 5-month run an extended program of water injection into the reactor feed (in concentrations up to 1 wt. per cent) was studied. As would be expected from its chemical composition, no deactivation of the catalyst or change in product distribution was found.

Sulfur in feed.—It has been shown that essentially all the sulfur in the naphtha feed is converted to hydrogen sulfide upon initial contact with the catalyst and further that the various classes of sulfur compounds behave as hydrogen sulfide toward the catalyst. Sulfur is a temporary poison on the catalyst, using up some of the catalyst surface and reducing activity. The fact that this is a temporary phenomenon has been repeatedly demonstrated by the catalyst returning to original activity when the sulfur level of the charge is reduced.

At feed-sulfur contents of about 0.1 per cent the depression of catalyst activity becomes significant enough to justify corrective action. Because of the large hydrogen recirculation, desulfurization of this recycle stream is a relatively simple method of handling higher-sulfur feed stocks. For example, in an operation with no sulfur removal, charging a feed containing 0.10 wt. per cent sulfur, 40 lb. per hour of sulfur would be charged over 1 ton of catalyst at a given space velocity and hydrogen recycle rate. If the sulfur content of the recycle gas were reduced to 10 grains per 100 cu. ft. the sulfur charged over the catalyst would be 9.5 lb. per ton of catalyst. This would be equivalent to charging a feed stock with 0.025 wt. per cent sulfur with no desulfurization facilities.

The fact that the Atlantic catalyst is not susceptible to deactivation by water makes it possible to use a conventional desulfurization process on the recycle gas. The product gas from such a desulfurization operation is normally saturated with water. It has also been shown experimentally that although extreme concentrations of amines, such as might be carried over from a desulfurization unit in an upset, cause a decline in catalyst activity, this is also only a temporary effect. After reduction of the amine concentration to normal levels, the catalyst activity was immediately restored.

Experimental data have been obtained in which abnormally high concentrations of certain metals which might conceivably be found in naphtha feeds were charged over the catalyst. For example, arsenic in several volatile forms was included in the reactor feed in concentrations up to 10,000 parts per billion. No harmful effect, either temporary or permanent, was observed.

Eventually, after many months' operation, physical and chemical changes in the catalyst will have reduced its activity to an undesirable extent. At this point, the catalyst will be returned to the supplier for chemical reconstitution.

We have attempted, in this paper, to show the many factors which contribute to a successful catalytic reforming process. It is our opinion that catalytic reforming will play an important part in every refiner's program to remain competitive in gasoline quality. Basically, we believe that the economic success of any catalytic reforming process will be determined primarily by the catalyst employed.

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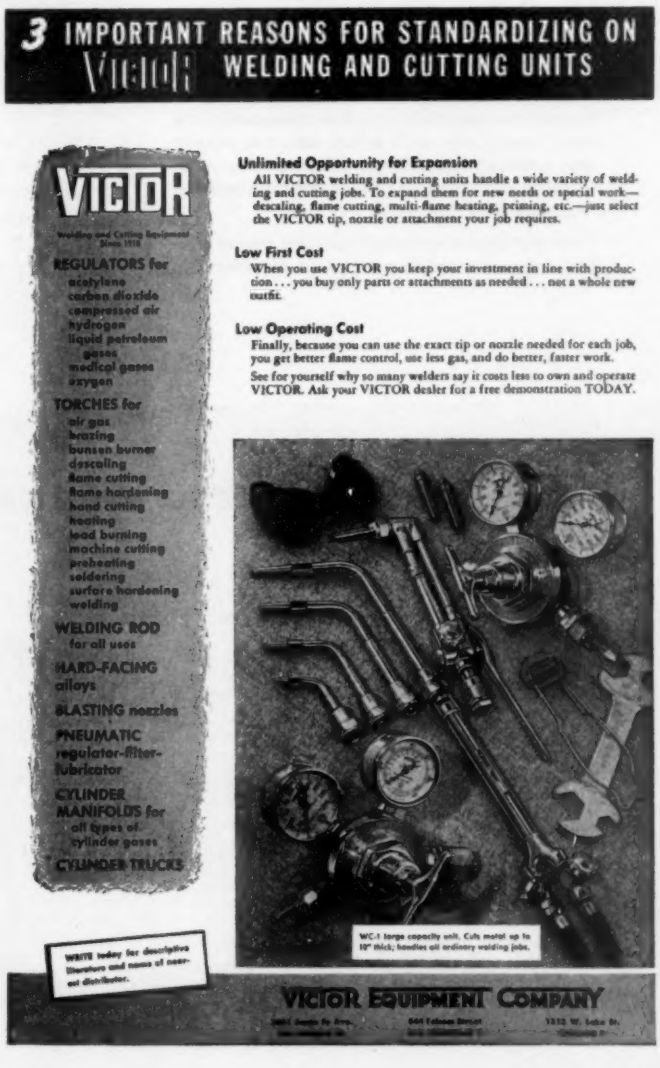
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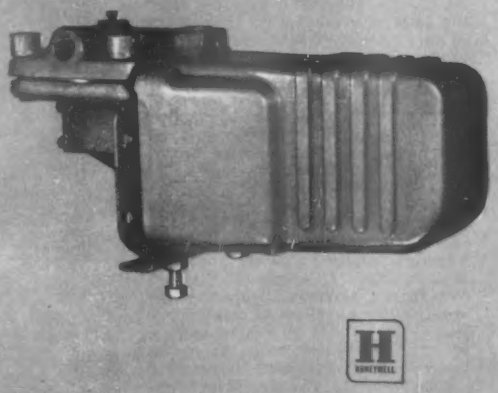

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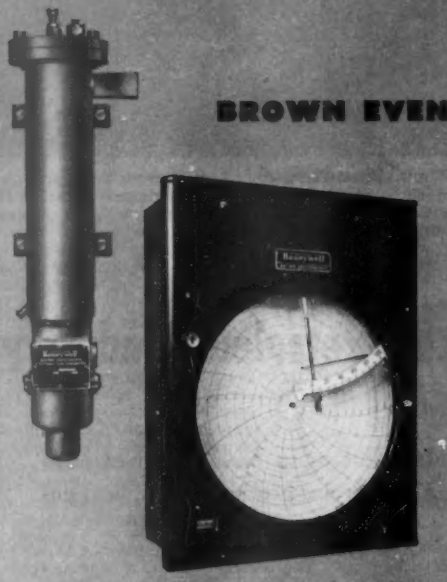

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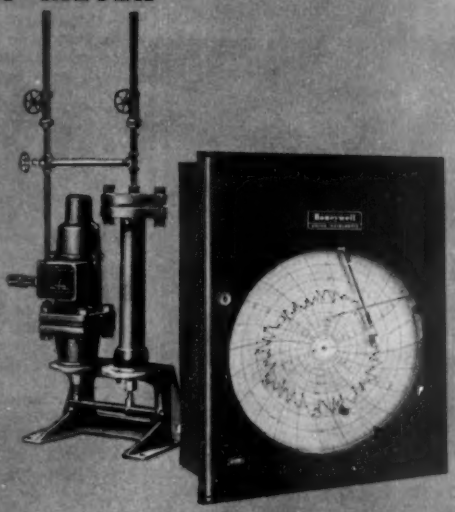

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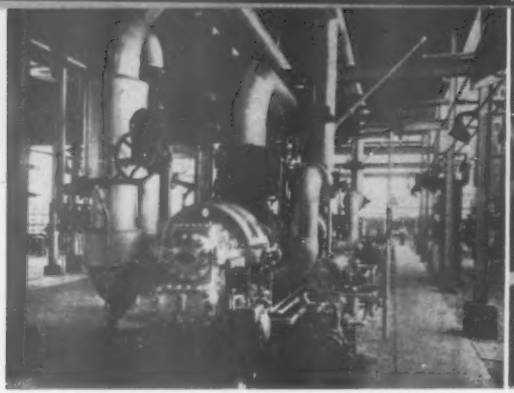


At Magnolia Petroleum Co.'s Seeligson field plant, two units for n-butane, each driven by a 500-hp. steam turbine at 7,100 r.p.m., furnish a 50° F. evaporating temperature for chilling lean oil, wet gas, and reflux.

This unit at The Texas Co.'s Port Neches, Tex., plant, is designed to supply 4,000 cu. ft. per minute of air at 15 psig. discharge pressure, and is driven by a steam turbine operating on waste steam at 8 psig.

The Evolution of

Centrifugal Compressors in the Petroleum Industry

by H. M. Shedd*

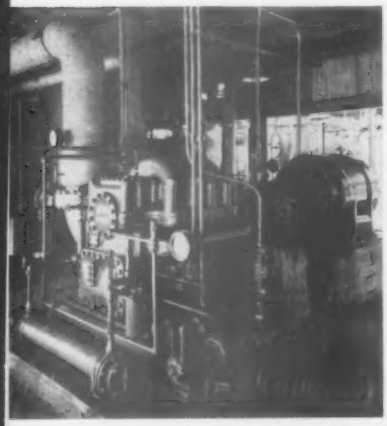
Within the past 10 years or so these machines have been adapted to numerous processing applications

PRIOR to 1940 the centrifugal compressor was virtually unknown in the petroleum industry. However, since this machine requires relatively small amounts of iron and steel for a given horsepower service, its application was greatly increased during the war years when shortages of these materials developed.

In little more than 10 years the centrifugal compressor has demonstrated its value in terms of high unit capacity, compactness, low operating and maintenance costs, and long life at sustained high efficiency. It has come to be regarded as one of the "building blocks" of the petroleum industry.

There is every indication that the present decade, with its new petroleum processes and techniques, will see an increasing number of centrifugal machines in both familiar and new applications.

*The Carrier Corp.



In the cat cracker installation of Shell Oil Co. at Deer Park, Tex., a 200-hp. explosionproof butane compressor produces an evaporator temperature of 45° F. for absorption-oil cooling.

Fluid Catalytic Cracking

Centrifugal compressors were first applied as an integral part of Houdry cracking facilities. For the most part, such units have been used to supply relatively large quantities of regeneration air in the range of from 8,000 to above 100,000 cu. ft. per minute, at discharge pressures of from 16 to 30 p.s.i.g. In recent years there has been a trend toward the upper pressure limit. Continental Oil Co.'s new refinery at Billings, Mont., will illustrate one of the more recent installations of this type. The unit there handles 25,000 cu. ft. per minute of air, compressing it to 26 psig., and is driven by a 2,500-hp. steam turbine.

During the years 1942 through 1945, installations were made in the new synthetic-rubber industry. Notable among these were installations made in the Cities Service Refining Corp. plant in Lake Charles, La., and the Humble Oil & Refining Co. plant in Baytown. In the former plant, four centrifugal compressors, driven by a total of approximately 5,100 hp., were installed to compress a butadiene mixture up to approximately 125 psig.

At the Humble butyl-rubber plant, a centrifugal compressor was added as a booster unit to an existing reciprocating compressor installation for low-temperature refrigeration. This unit provides a reactor temperature of approximately 150° below zero and compresses ethylene from 12 to 24.7 psig., at which pressure it discharges into the intake manifold of a battery of reciprocating gas-engine-driven compressors. The centrifugal unit is driven by a 1,700-hp. steam turbine.

Also of interest in a description of the development of the centrifugal compressor, although not a part of the petroleum industry, are the many centrifugal compressors which found their way into supersonic test-tunnel installations. Notable among these are the tunnels at Aberdeen, Md., and at Moffett field in California. In the installation at Aberdeen, there are five air compressors, all driven by synchronous motors, two of which are 3,000 hp. and three of 2,000 hp.

Gasoline Plants

Also, the war year 1944 saw the first centrifugal compressors installed for refrigeration service in a gasoline plant. This installation was made at the La Gloria Corp. plant at Falfurrias, Tex. The system consists of two steam-turbine-driven units using isobutane as the refrigerant. An evaporator temperature of approximately 30° F. is maintained. Each turbine driver is rated at 375 hp. and operates at 6,800 r.p.m. The refrigeration is used for lean-absorption-oil cooling and deethanizer reflux condensing. It

is particularly interesting to note that this complete installation is located out-of-doors.

Since this initial installation, centrifugal refrigeration has come to play an increasingly prominent part in gasoline-plant design. New plants have been designed around this feature. Notable among these are the new plants of Southwest Gas Producing Co. at DuBack, La., and the Chicago Corp. at Carthage, Tex. Each of these plants employs a single 1,400-hp. centrifugal propane compressor which provides refrigeration at 50° F. evaporator level for wet gas and absorption oil chilling.

In this same category is the Seeligson field plant operated by Magnolia Petroleum Co. Two units for n-butane are used in the plant, each unit driven by a 500-hp. steam turbine at 7,100 r.p.m., and furnishing a 50° F. evaporating temperature for chilling lean oil, wet gas, and reflux.

Incorporated in the design of this same plant are two centrifugal compressors, which serve as the first stage of the field compressor station. This represents the first centrifugal installation of this type. All of these new gasoline plants have been completed and put into operation within the past several years.

In addition, other already existing gasoline plants have taken advantage of centrifugal refrigeration as a basis of modernization programs. In this category must be included such plants as Warren Petroleum Corp. at Breckenridge, Tex.; Haynesville Operators Committee at Haynesville, La.; and J. S. Abercrombie Old Ocean at Sweeny, Tex. Each of these plants has single-compressor installations. The one at Haynesville uses n-butane as the refrigerant, whereas at Sweeny the refrigerant is isobutane. Each installation provides evaporator temperature of 55° F.

Another important installation is the one for Humble Oil & Refining Co. at Katy, Tex. Refrigeration is supplied to Katy-3 plant by two 1,600-hp. steam-turbine-driven centrifugals, using propane as the refrigerant. Absorption-oil chilling, reabsorber chilling, and wet-gas chilling are obtained.

In addition to the two units mentioned above, there is an installation involving a single, centrifugal, propane-refrigeration compressor, of equal size, which supplies refrigeration for Katy-1 and Katy-2 plants.

Other Refinery Applications

During the same period as the many installations in gasoline plants which have been enumerated above, similar strides were being taken in refineries and chemical plants in applying centrifugal compressors for services other than catalytic cracking air blowers.

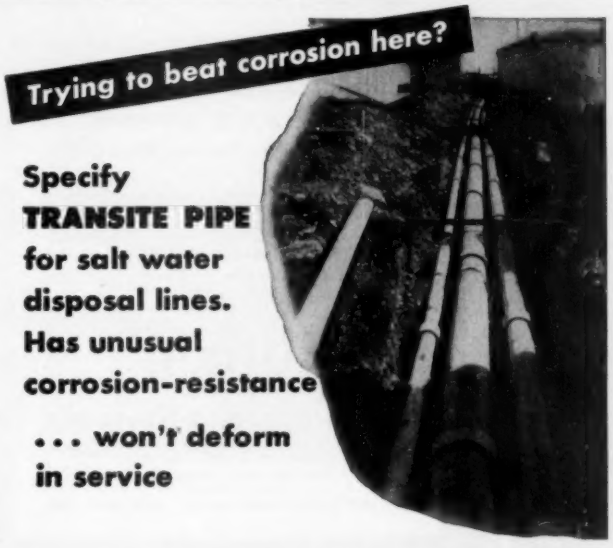
In 1946, the new cat-cracker installation of Shell Oil Co. at Deer Park, Tex., was completed. In addition to two regenerative air blowers, each of 2,500 hp., this plant also includes a 200-hp. explosionproof, motor-driven, butane compressor. This unit produces an evaporator temperature of 45° F. and is used for absorption-oil cooling.

Other refinery applications utilizing centrifugal compressors are methyl ethyl ketone dewaxing, sulfur dioxide compression, and in alkylation.

At Humble Oil in Baytown and at Atlantic Refining in Point Breeze, Pa., there are two units each. Both of these plants were completed at about the same time in 1947-48 and represent the first application of centrifugal compressors to M.E.K. dewaxing plants. Each of the compressors at Atlantic Refining's plant are 1,000 hp. at 9,400 r.p.m., and at Humble each unit is approximately 2,000 hp. at 9,200 r.p.m. In both installations, the evaporator temperature is approximately —20° F.

Refiners in 1945 and 1946 were also learning about the use of centrifugal compressors for service other than cat-air blowers and refrigeration. Two 630 hp.-units, operating at 9,800 r.p.m., were installed by Standard Oil Co. of California at El Segundo, for the compression of SO_2 vapor. These units are used to compress from atmospheric pressure to approximately 90 psig. and are used for SO_2 separation of oils.

More recently, centrifugal compressors to furnish refrigeration for alkylation units have been receiving attention. One unit has been installed as a part of a modernization program on the HF alkylation contactors at



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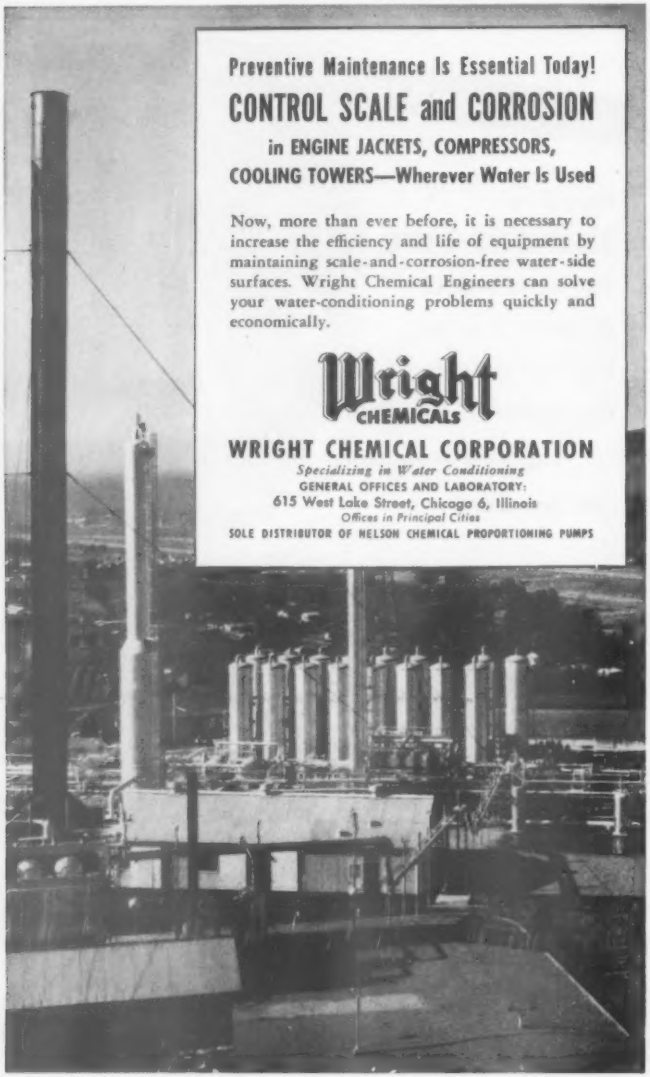
the Sinclair Refining Co. plant at Corpus Christi. This unit uses isobutane refrigerant and requires 600 hp. An especially interesting fact about this installation is that the steam turbine is supplied with 6-psig. steam at the intake with the exhaust at approximately 26-in. Hg vacuum.

Low-pressure steam is found in many refineries and can be used in this way. Several types of refrigeration were considered for this particular project and one of the deciding factors in this case was the fact that this system required less cooling-tower water for refrigerant and steam condensation which made it possible to use existing cooling-tower facilities without the necessity of additional towers being installed.

Mid-Continent Petroleum Co. in Tulsa has included a centrifugal compressor to provide refrigeration for its new H_2SO_4 alkylation unit. This unit compresses a propane-butane mixture and is driven by a 585-hp. steam turbine. It is designed to produce an evaporating temperature of 35° F. in the refrigeration cycle.

An installation at the Port Neches, Tex., plant of The Texas Co. will be cited as final evidence of the extent to which centrifugal compressors have penetrated the refinery. This compressor installation is used to supply air for oxidation of residium to asphalt. Three different makes of centrifugal compressors are included in this plant. The most recent is a unit designed to supply 4,000 cu. ft. per minute of air at 15.0-psig. discharge pressure. The driving force is supplied, again, by a steam turbine designed to produce 305 hp. at 10,000 r.p.m when supplied with waste steam at 8 psig. The exhaust steam is condensed at 26-in. Hg vacuum by means of a barometric condenser.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Transportation

A great deal of prominence has been given to the part which centrifugal compressors are presently playing in the field of pipe-line compression. This subject has been adequately covered in recent literature and no further amplification will be attempted at this time.

However, it may be interesting to know that in the transportation field, the first centrifugal-compressor application was related to the transportation of liquefied petroleum gas. This compressor was installed in 1948 on board the SS Natalie Warren, owned and operated by Warren Petroleum Corp. The unit serves two purposes. It is used initially to pressurize the ship storage tanks in order to force the liquefied petroleum gas up standpipes into the liquid pump inlets. After all of the liquid has been unloaded the unit is used to evacuate the ship storage tanks of the vapor. The L.P.G. vapor, thus evacuated, is condensed by sea-water condensers and pumped ashore. When propane is the cargo, the pressure in the ship storage tanks is reduced from approximately 200 to 30 psig.

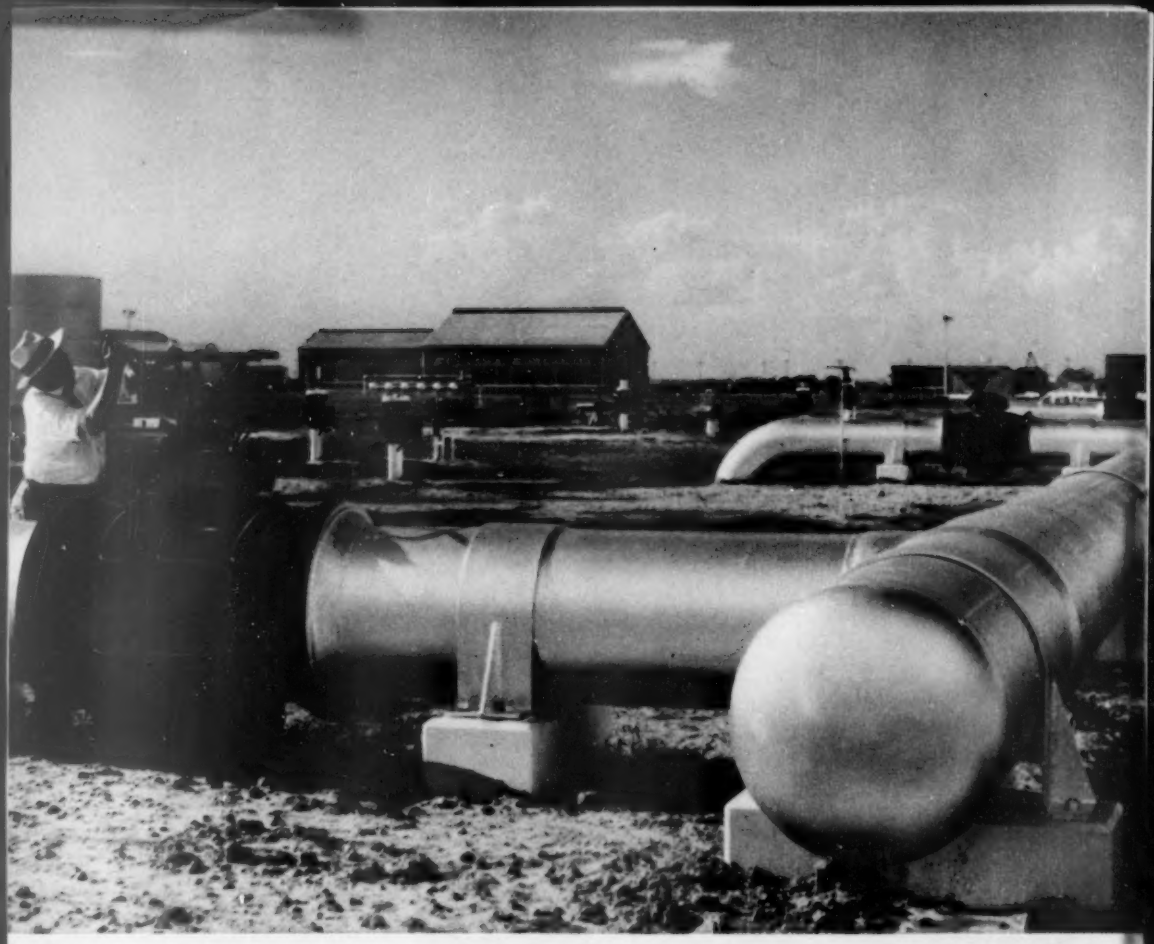
Chemicals

In the chemical field, centrifugal compressors have been applied in numerous ways. Included among these are applications involving the compression of oxygen, air, and hydrocarbons.

Several oxygen compressors have been installed. Representative of these is the one installed at the Carbide & Chemical Corp. plant at Texas City, Tex. This plant was designed by Linde Air Products. The compressor handles 1,970 cu. ft. per minute of oxygen which is compressed to 34 psig. The unit operates at 9,550 r.p.m. and requires 300 hp.

Centrifugal air compressors have been installed at Reichold Chemicals at Detroit and at Wyandotte Chemicals at Wyandotte, Mich. The unit at Reichold handles 10,000 cu. ft. per minute and is driven by a 700-hp. motor through a gear at 7,600 r.p.m. The unit at Wyandotte handles 4,500 cu. ft. per minute and is driven by a 580-hp. turbine at 10,200 r.p.m.

Refrigeration is also used in chemical plants as is demonstrated by two centrifugal compressors installed at Shell Chemical Corp. at Deer Park, Tex. Both of these units operate above 8,000 r.p.m. and require approximately 400 hp.



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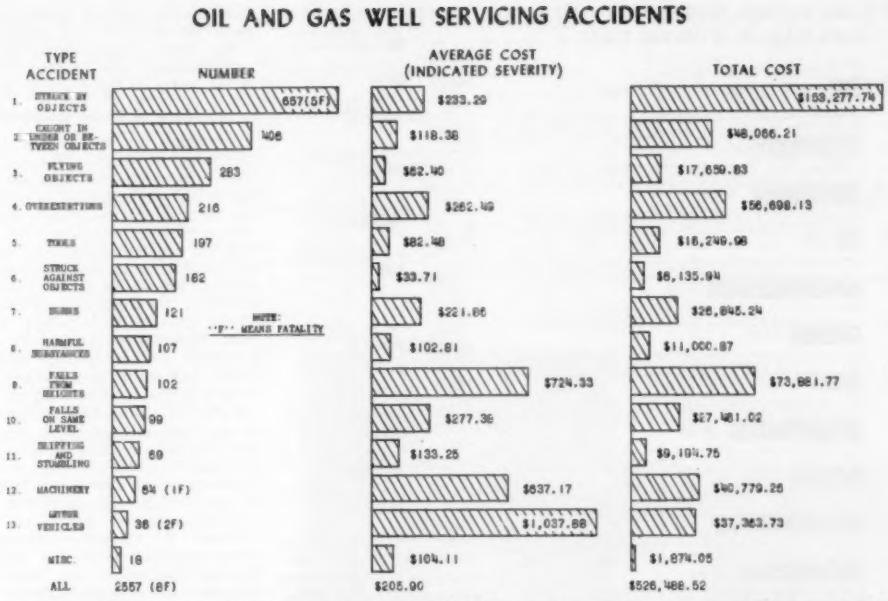

Chart 1—Types and costs of accidents reported by well-servicing contractors to the Texas Employers' Insurance Association.

Mr. Well-Servicing Contractor:

Can You Afford More "Accidental" Overhead?

by H. E. Scates*

This accident analysis was prepared by the Safety Engineering Department of the Texas Employers' Insurance Association for the benefit of the oil and gas well servicing industry. It represents an effort to explain why and how 2,557 accidents reported by Texas contractors occurred. Compensated cost was $526,488.52.

MANY Texans are taking a dim view of their state's new automobile responsibility and inspection laws, according to letters to editors and newspaper stories containing quoted comments. At various times similar legislation in other states caused a like reaction. Always there are elements of the population greeting such laws with a great amount of resentment.

Why? Well, among other things it has been pointed out that the majority of automobile accidents are caused by a minority of chronic violators whose driving habits and attitude bring injury to others. To curb these troublemakers the laws were passed. But, as the argument goes, the innocent are penalized along with the guilty.

No side is taken here with either the pros or cons of these views. They are only mentioned to illustrate a point: Could it be that some oil and gas well-servicing contractors feel that a minority of their number report the majority of the industry's accidents? As in the case of motor vehicle legislation, does an increase in workmen's compensation insurance rates represent a penalty visited upon all as a result of the accident experience of a few?

During the past few years the workmen's compensation rates for well servicing has shown an up and down trend. In 1949 the rate went up 0.5 per cent over the 1948 rate. Then, in 1950, the rate skidded 11.9 per cent and in 1951 went down another 0.3 per cent. This year contractors found their rate had taken an upward swing of 11.4 per cent quite a jump for the man with a big payroll.

Rates only reflect the accident experience (losses) of the policy years used to develop them, and in the case of 1952 these were the policy years 1948 and 1949. If the reader is a contractor he should realize that an accident he reports today is going to come back to him in a future rate. Will that rate be higher? lower? The answer, of course, rests with well-servicing contractors, individually and collectively. Figuratively speaking, the industry's pocketbook will take on weight or assume a leaner ap-

*Research engineer, Safety Engineering Department, Texas Employers Association, Dallas.

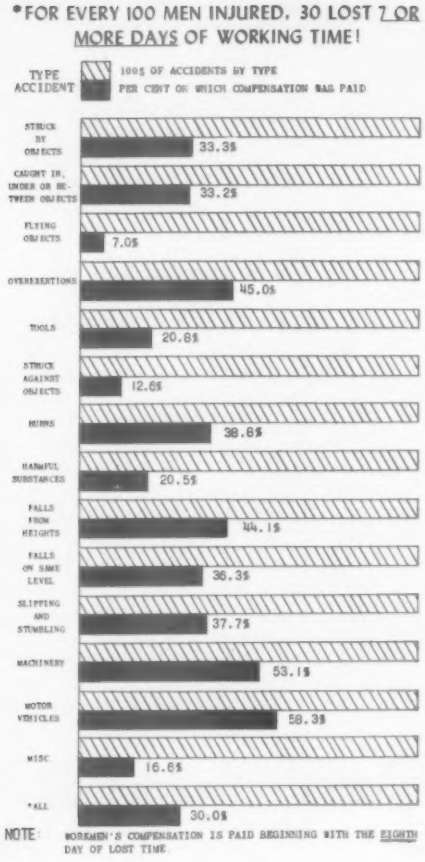

Chart 2—(Left) Types of accidents and percentage compensation as reported to the Texas Employers' Insurance Association.

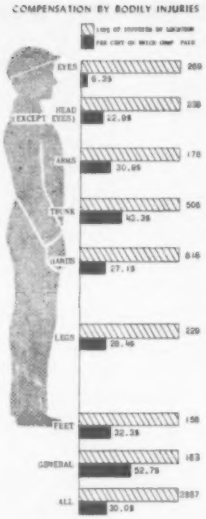

Chart 3—(Above) Types of bodily injuries and percentage compensation as reported to the Texas Employers' Insurance Association.

pearance depending on accident-prevention measures now.*

Analyses of Costs

The well-servicing industry has had its full share of severe injuries if the average accident cost compared to that of other industries is a fair indication of such severity. In accident analyses similar to this one, 36 Texas industries produced average accident costs ranging from a low of $24.43 per accident to a high of $320.51. Well-servicing accidents at $205.90 have the questionable distinction of ranking third in severity. Within its own industry group, oil, well-servicing compares even less favorably. The average cost for well-servicing accidents is 16 per cent more than drilling accidents ($177.40) and 42 per cent more than accidents resulting from lease operations ($145.06).

What is the nature?—What kind of accidents have been reported by well-servicing contractors? Which are more numerous? . . . have the greatest severity? . . . result in the greatest number of lost man-hours?

To answer the above and other questions the accompanying charts were prepared.

Chart 1 gives both a visual and numerical comparison of the various accident types by number, cost and average cost.

Chart 2 shows the percentage of injured men who received compensation, another way of saying that they were off the job 7 or more days.*

The third chart shows how this compensation was divided according to the parts of the body injured.

Cause of These Accidents

So much for the **results** of well-servicing accidents. What **caused** them? What are the most common of the industry's hazards? Where would the contractor concentrate his safety efforts with the view in mind of cutting his accident frequency and accident costs? As far as this study is concerned, he would first examine the so-called "handling objects" accidents. These are accidents which have as their basic cause the failure of men properly to safeguard themselves while they are in actual contact with, or are in the near-vicinity of objects which could somehow strike, pinch, or cut them. Also included within this meaning are muscular injuries caused by handling objects. On the first chart these accident types are Nos. 1, 2, 4, and 6. The one exception to the conditions given exists in No. 1, "Struck By Objects." There were some free-falling objects which the injured men could not always have foreseen or guarded against. These accidents will be discussed further on.

Struck by objects.—The 657 accidents in this category had one thing in common. The object moved and the man didn't, at least not fast enough.

Pipe, tubing, rods, drill collars and other such elongated materiel were involved in 32 per cent of the struck by . . . accidents. These objects swung, slipped, rolled and so on during normal servicing activities including their being handled by physical means alone, such as unloading operations. Men dropped slips on their feet, 77 were struck by tongs and elevators, 45 by cranks and clutch or brake levers. Snapping or whipping catlines, safety chains, and cables all took their toll. So did steel plates, derrick parts, heavy timbers, and a miscellany of equipment being handled.

The exception previously mentioned were those free-falling objects causing 8.8 per cent of the struck by . . . accidents. Though not in the majority, it was a common situation when elevators unlatched and allowed rods or tubing to fall and hurt a man. There were such situations as a board falling from the top of a tank as well as a falling sheave, a clamp, tools, and even thawing ice.

These were the accidents accounting for 25.7 per cent of the number and 29.1 per cent of the cost in this

*Rate-making procedure is based upon the experience developed during the two latest available policy years. A policy year, such as 1952, includes the experience of all policies with inception dates effective from January 1 to December 31, 1952, inclusive. Since policies normally run for 1 year, any given policy year overlaps into two calendar years.

The workmen's compensation rate for 1952 was based upon the experience developed in the policy years 1948 and 1949, these being the two latest available periods from which to take the needed information. The experience of the 1950 policy year has been completed as of December 31, 1951, but is as yet an unknown factor. Obviously, because of the time element, that is, the months of necessary study to gather and assay the experience developed, the 1950 policy year data will only be completed in 1952. That is why the 1949 and 1950 policy years could not be used as the two latest available policy years from which to determine the 1952 rate.

*There are two exceptions: (1) When an employe is off the job due to injury for 4 weeks or more, he is then also paid for the first week of disability. (2) An employe who receives a specific injury, such as the loss of a finger, is due a certain amount regardless of the fact that he may not lose any time from work.

analysis. Thirty-three of every one hundred men injured lost time. Five lost their lives.

Caught in, under or between objects.—Accidents under this heading had an outstanding characteristic. Of 406 injured men, 369 or 91 per cent received hand injuries, the most prevalent injuries in this entire study. They numbered 818 or 32 per cent from accidents of all types and almost half of them originated from these caught in . . . accidents.

The agents of injury were substantially the same as those involved in struck by . . . accidents plus a few more such as tong or elevator latches and sheaves of pulleys. A number of victims were also caught in spinning lines as well as between various cables, ropes, and secondary objects (no machinery involved). Lost time cases totaled 33.2 per cent.

Other Accident Categories

Of the two remaining categories pertaining to the handling of objects, one needs but brief notice. No. 5 or "Struck Against Objects" is another major source of hand injuries. More than half of the men were so injured and although these injuries were not as severe as those in the preceding accident types, 12.6 per cent of the injured still lost time. Their injuries resulted from metal burrs, cable strands, and splinters as well as stepping on nails.

Muscular overexertions, No. 4, was saved for special comment. Most of these accidents are caused by incorrect lifting such as stooping over from the waist or by attempts to lift too much. Others result from poor balance or uneven footing whether the worker is lifting, pushing, or pulling. These were the principal factors bringing back and abdominal (trunk) injuries to 88 per cent of the injured men in this category. Only 25 men suffered muscular injuries to other parts of the body.

The muscular overexertion type of accident is seldom spectacular; it has no "glamor" so to speak, no blood, no broken bones and other visual evidence of great injury and pain. Nonetheless, 45 per cent of these muscular injuries put a man off the job. Surely this fact reflects the need of teaching workers something of their own muscular construction, why they should lift with their legs and not their backs because the stronger, heavier leg muscles were mean by nature to do this work.

From the standpoint of both accident frequency and accident losses there is no greater need, no greater chance for the prevention of a particularly troublesome type of accident. Trunk injuries in this study were second only to hand injuries in number. Not only were they far greater in cost, they were the most expensive injuries of all types with a compensated cost of $158,596.34 for 506 reported cases. Trunk injuries in the overexertion category alone accounted for 33.5 per cent of this cost and almost 38 per cent of this number.

Teach Correct Work Practices

The four accident types discussed thus far were, as was earlier stressed, mainly the result of handling objects. They were responsible for 57 per cent of all claims and half the cost of the 2,557 accidents analyzed. Recognizing that there were exceptions, these accidents well illustrate why men should be taught correct work practices and why it is necessary that this teaching be **consistently** applied on the job. There is such a thing as being safety conscious while keeping one's mind on the job, but this attitude of mind can come only with a discussion of hazards between management and personnel from which should develop sensible, serious and applicable rules of safety.

The No. 1 hazard in the majority of the preceding accidents was the man himself, the way he handled himself, his self-exposure to danger. Concerning this last point—and this is said pointedly—most of the agents of injury became hazards only when the man exposed himself to them in one or more of the ways described. Pipe rolling from a rack isn't going

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to hurt a man with the presence of mind to think of this possibility. A worker who knows he's not a human derrick isn't going to strain his back lifting when he can get some help. Elevator and tong latches can't snap at a man. First, the employe has to "ask for it" before he "gets it!"

Flying Objects; Burn Injuries

Other accidents in this study are no less important than those discussed. "Flying Objects," for example, produced a high frequency, a low cost, and only four severe injuries. They were eye injuries involving loss of vision to some degree. Understandably, flying objects, usually small particles of metal, most often get into the act when an eye is injured. Of the 283 men injured, 67.8 per cent sustained eye injuries.

Flying objects were of two types, those which struck with forceful impact and those which were more or less irritants, such as dirt and rust. The former were mostly metal particles from hammering on tongs, pipe, and other metal objects. Flying metal particles were also produced from grinding and chiseling operations.

Wrenches were the culprits in more than half of the tool accidents and figured in 59 per cent of this category's cost. Sledge hammers, crow bars, chisels, and other common tools made up the remainder. One out of five men lost time.

Forty-five per cent of the burn injuries were caused by burning or exploding gasoline and gas, both natural and butane. Seventy per cent of the cost was attributable to these agents of injury. Men were burned by steam, hot water and oil, molten metal, backfiring motors, and a miscellany of hot objects. Ten per cent were flash burns of the eyes caused by welding torches. The cost of five electrical burns was in excess of $5,000. Lost-time injuries totaled 38.8 per cent.

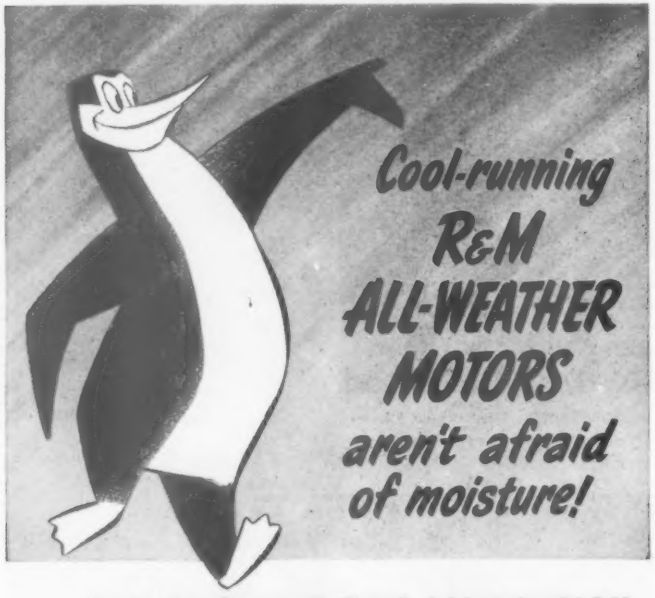
The harmful substances encountered included acid, caustic, paint, and cement. Some men reacted to contact with gasoline, kerosine, and oil. There was no particular concentration of injuries due to these agents. The inhalation of various gasses, however, accounted for 25 per cent of the disabilities, 51 per cent of the cost, and was mainly responsible for a fifth of the men losing time.

Men who fell from various heights were involved in the second most expensive group of accidents in this analysis and were second, too, in average cost, $724.33. The 102 falls reported were only 4 per cent of the over-all total but the cost of $73,881.77 was 14 per cent of the total losses. The severity of injuries was high, explaining why 44.1 per cent of the men had to leave the job. How many of the following accidents do you think were preventable?

Falls from rig floors caused 29 of these accidents and accounted for 41 per cent of the category cost. Men fell from various points in the derrick, from masts, christmas trees, and one who fell from a double board suffered injuries resulting in compensation exceeding $13,000! There were also falls from ladders, steps, runways, and from atop machines. Seventeen workers fell from trucks and nine found holes in the rig floor big enough to fall through.

"Falls on the Same Level" and "Slipping and Stumbling" are headed separately only because in one group the men did not fall. Otherwise the hazards were the same. Oil, water, mud, ice, and miscellaneous objects caused workers to lose their footing in one manner or another. Of the 99 men who fell, 36 were lost-time cases. Surprisingly, of the 69 men who slipped or stumbled, 26 also left the job, usually because of musuclar strains.

No matter in what industry they occur, machinery accidents are particularly vicious and in the well-servicing industry they are no exception. At an average cost of $613.17 they ranked third, just behind falls from heights, but there were only 64 machinery accidents opposed to 102 falls. Seventeen men were caught by catlines and pulled into catheads for 58.6 per cent of the compensated cost in this category. Belts and pulleys and rotary chains trapped 13 workers. The remaining accidents involved a mis-



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cellany of mechanical units. One man was killed when he was struck by a counterbalance. Thirty-four of 64 injured men lost time.

The 36 motor-vehicle accidents followed the pattern of these accidents everywhere. Sixteen cars and trucks overturned, some on wet pavement. Excessive speed for existing condition caused most of these accidents as was the case in collisions with other vehicles and the striking of fixed objects. The drivers fell asleep. Mechanical failure caused three accidents. Two men were killed.

What Price for the Injured?

There is one thing this analysis cannot analyze. It is the pain, the misery, the hoping, and the loss of hope when a man looks at a stump without an arm. One man in this study must have had these emotions. With thoughts of home and family, what were the financial worries of 21 servicing workers who lost parts of fingers, whole fingers, even a hand? Was it worse for the three employes losing a foot?

What of the 169 fractures reported? Some were minor but 11 were of the skull and 3 of these men died. So did a worker who lingered with a broken back. Crushed and internally injured, another man met death.

These are a few of the more severe injuries which, along with burns and mangling put 769 men on the serious list. That's almost one out of every three men injured in this study. Can money make restitution to these men? No, it can help; it cannot compensate for lost wages and bodily injury.

Here is the humanitarian view for accident prevention, a view some safety writers and speakers touch but lightly for fear they will be judged as being dramatic sentimentalists. That point aside, the fact remains that the well-servicing industry, as pointed out earlier, has had its share of severe injuries and the accidents causing them are preventable in the great majority.

It is hoped that the reader will share this view if he accepts the factual reporting which has been the purpose of this analysis. Employers' accident reports furnished the information for this cross section of the industry's accidents and perhaps the reader's own organization was represented among these reports. Necessarily, some interpretation as to accident causes had to be made on the basis of the information furnished by a minority of employers but for the most part the cause of the accident was clearly stated.

Well-servicing accidents are being currently reported. No one can say now what results they will have as to future workmen's compensation insurance rates, delayed work, damaged equipment, and a host of other cost factors. Phrased from an earlier statemen, the answer rests with well-servicing contractors . . . "individually and collectively!"

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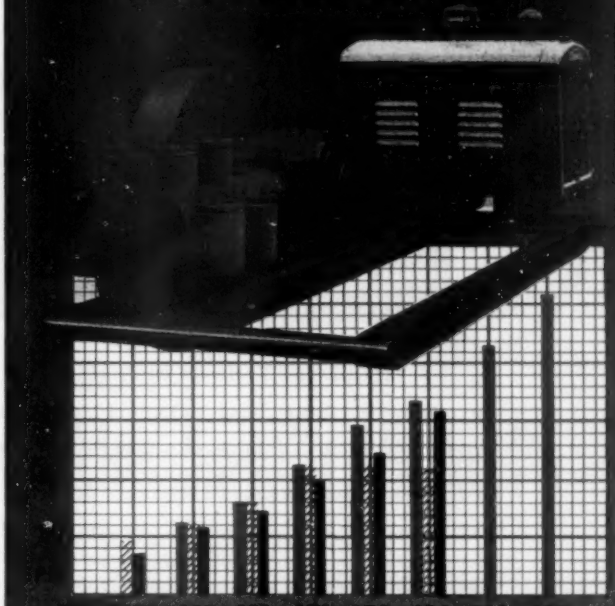
7200 800 600 450 350 300 232 195
Wheatley 7024-4 x 6 @ 100 rpm Piston Speed = 100 FPM
Wheatley 7036-6 x 6 @ 100 rpm Piston Speed = 100 FPM
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Fig. 1—Map showing the location of the Tertiary Uinta basin with relation to other intermontane basins of the northern Rocky Mountain region.

Fig. 2—Map showing outline of the Tertiary Uinta basin, locations of the producing oil fields, and the Vernal area, where initial efforts to develop production were made.

YESTERDAY . . . Almost ignored. TODAY . . .

Rocky Mountain "Hot Spot": Uinta Basin

It is anticipated that 1952 will see between 50 and 70 new wells drilled—100 per cent increase over 1951

by Verne E. Farmer, Jr.

IN the course of only the past 3 years Utah's Uinta basin has been transformed from an area almost completely ignored by the oil industry to one of the most prominent "hot spots" of the Rocky Mountain region. The acceleration of activity during this period has been steady and consistent, although nothing of boom proportions has developed. The basin's comparative isolation, its extremely complex geology, and the abnormally high cost of exploration and drilling have all contributed to the slowness and caution with which all major operators have proceeded.

A deep basin.—The Tertiary portion of the Uinta basin encompasses some 8,000 sq. miles and lies in the extreme northeast corner of Utah. Structurally it is not radically unlike either the Green River basin or the Piceance basin on the north or east; however, its total thickness of Tertiary sediments far exceeds either of these two. Over 12,000 ft. of Tertiary has actually been drilled in the deep, northern portion near the axis and there is little doubt that thicknesses in excess of 15,000 ft. exist.

The Uinta basin has long been noted for the prolific occurrence and wide variety of hydrocarbons in surface outcrops. Oil shales, several solid hydrocarbons such as gilsonite, and oil-saturated sands are found in considerable abundance at the surface. It is difficult to imagine that such striking indications of possible oil accumulations were so long virtually ignored by the oil industry. However, prior to 1946 none of the major operators has shown any sustained interest in the area. Before this time only 22 wells had been drilled in the entire basin and most of these were concentrated in the Vernal area. All but two of this total were very shallow cable-tool tests drilled by independent operators and none reached the depths from which production has been more recently established.

Geology.—Structurally the Uinta basin is a typical intermontane Tertiary basin with a steep north flank and an axis near the north side roughly paralleling the margin. Tertiary rocks range in age from Oligocene to Paleocene with four principal formations and several subdivisions being generally recognized. The Eocene-Green River formation has, however, become the one of prime economic importance. The lithology of the Green River varies extremely between different parts of the basin. However, it generally consists principally of dense, dolomitic shales and oil shales with widely varying and lesser amounts of limestones, sandstones, and siltstones, all of lacustrine origin. Except in the south and western portions of the basin where it outcrops, the Green River lies between the nonlacustrine sediments of the Uinta and Wasatch formations. The maximum known thickness of Green River type sediments is slightly over 7,000 ft.

Modern Exploratory Effort

The current era of activity in the Uinta basin began in 1946 when Carter Oil Co. drilled its first well in the Vernal area, the 1 Edna Davis. This test was followed by three ad-

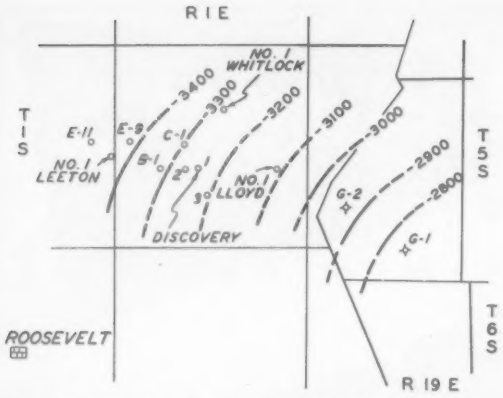

Fig. 3—Contour map of the Roosevelt-Gusher area suggesting gentle nosing plunging to the northwest.

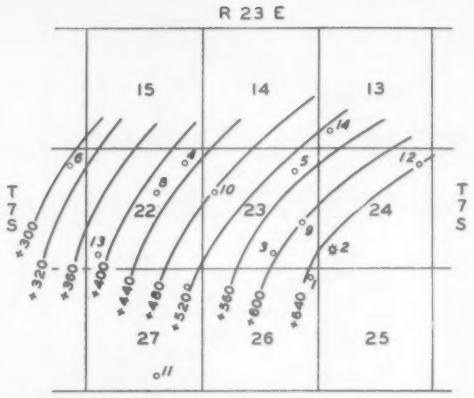

Fig. 5—Contour map of the Red Wash area which, as at Roosevelt, suggests only a gentle, northwest plunging nose.

ditional wells, all in the same general area. Two of these, the 1 Knudson and the Nelson, both recovered free oil on drill-stem tests but attempts to complete for production were unsuccessful. (See Fig. 2).

First discovery.—Uinta basin's first discovery came in 1949 at Roosevelt in the Carter-Stanolind Oil & Gas Co. 1 Ute Tribal. This well was completed at 9,200 ft. in the lower Green River formation and, following acid treatment, flowed 33°-gravity oil at a rate of 1,633 bbl. a day. A peculiarity of this and all oil thus far produced in the Uinta basin is its abnormally high pour point, which ranges from about 85° to 100°. At average room temperature this oil freezes into a grease-like solid. Needless to say this condition has caused quite a number of production problems.

In the 18 months following the Roosevelt discovery, other wildcats were drilled at Bitter Creek, Gusher, Bluebell, and Strawberry. The first Strawberry well was abandoned at 2,700 ft. as a mechanical failure. However, the second well was taken below 10,000 ft. All four of these wells were primarily Tertiary tests although Seaboard Oil Co.'s Bitter Creek wildcat drilled through the greater portion of the Cretaceous-Mesaverde formation.

Second strike. — In January 1951 The California Co. 1 Red Wash encountered production from a series of comparatively thin sands near the base of the Green River to become the basin's second Tertiary oil field. Only 6 months later the first test on the Carter-Continental Oil Co. Duchesne Unit established production of 42°-gravity oil from a transition zone between the Green River and Wasatch formations. Oddly enough, this Duchesne oil, while it has the highest gravity of any being produced in the area, also has the highest pour point —an even 100°.

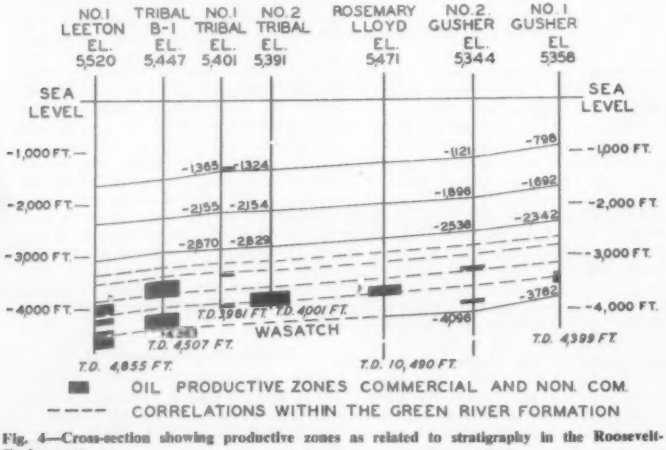

Fig. 4—Cross-section showing productive zones as related to stratigraphy in the Roosevelt-Gusher area.

THE AUTHOR

Verne E. Farmer, Jr. is a geologist for Carter Oil Co. in Vernal, Utah. He is a graduate of University of Wyoming and joined Carter in 1946, following 3½ years' service with the Army Air Force in the European and African Theaters. Paper presented at second annual meeting of Rocky Mountain Section of the American Association of Petroleum Geologists, Salt Lake City.

During the same period in which the Duchesne and Red Wash discoveries were being made, several unsuccessful wildcats were drilled; a fifth test in the Vernal area, a second in the Gusher block, and an east stepout from Roosevelt pool were all either dry or noncommercial in the Green River. The east Roosevelt stepout failed to establish commercial production in the Roosevelt producing zone; however, it is currently being taken deeper. Sun Oil Co.'s South Ouray and Carter's Willow Creek both went into the Cretaceous. Willow Creek has been abandoned very recently following unsuccessful tests of an oil show in the Mesaverde.

Continental has completed three stratigraphic tests in the Watson and Oil Springs areas and currently is drilling a wildcat in the eastern portion of its Oil Springs unit. A wildcat drilled east of Red Wash by Mid-Continent Petroleum Corp. has also recently been abandoned in the Wasatch. Just across the Colorado line the Johnson-Bunn organization completed an 11-million-cubic-foot gas well in the Mesaverde at 2,500 ft. Offsets to the east and west have, however, failed to extend the reservoir. These same operators also drilled an unsuccessful Dakota test in the

eastern portion of the basin near the White River.

The various other circled locations shown are either announced wildcats or drilling wells: Asphalt Creek and Peter's Point are locations. Jack Canyon and three wells east of Duchesne are drilling. Three are in operation between Roosevelt and Red Wash, and one is drilling northeast of known production at Roosevelt.

Roosvelt Field

In the 3½ years since its discovery only four wells have been completed in Roosevelt pool and two of these, the B-1 and the Leeton, only very recently. Unitization has finally been completed and a definite drilling program is under way. At present there are the four new locations shown offsetting production. The 1 Lloyd was noncommercial in the Roosevelt producing zone but is being taken deeper. The Whitlock, to the north, has not yet reached the productive lower Green River. Both the Gushers had promising shows of oil but, like the Lloyd, were noncommercial.

Coincidentally, the first seven wells in this area were very nearly in an east-west line. This arrangement has obviously made it possible to determine any accurate structural picture. The few contours that can be drawn suggest only a gentle nosing plunging to the northwest. (See Fig. 3).

Fractured reservoir. — One of the pecularities of the Roosevelt pool is the fact that, so far as is presently known, the reservoir consists entirely of fracture porosity. No standstone or other rock with intergranular porosity and permeability capable of production has yet been found.

For the most part these fractures consist of vertical crevices ranging in length from a few inches to several feet. Very positive drill-stem tests have indicated productive possibilities through about 1,200 ft. of stratigraphic section without including the highest show in the discovery well. This fracturing does not appear to follow any stratigraphic horizon nor is it confined to any particular type of lithology. (See Fig. 4).

The greater portion of the lower Green River at Roosvelt consists of oil shale type material with fairly numerous thin beds of fine sand, silt, and limestone. Fracturing is found in each of these different lithologies and commonly extends from one to the other with no regard whatsoever for the lithic change. Thus far it is not definitely known whether or not there is vertical interconnection between these several zones so as to form a single reservoir. Following the discovery of this pool there was some doubt as to whether or not such a fractured reservoir could have sufficient total porosity to constitute a major accumulation. Our knowledge of the exact extent and nature of this reservoir is admittedly still very limited, but the discovery well alone

(*Continued on page 203*)

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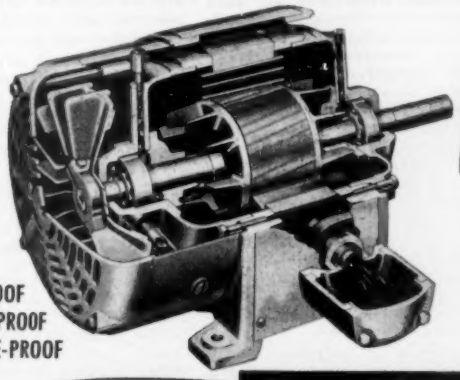

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Volumetrically Weighting Reservoir Data

by Kenneth F. Anderson*

PETROLEUM reservoir pressures and some other reservoir data are superior when weighted volumetrically to those weighted in any other manner. However, volumetrically weighted averages of reservoir data are seldom obtained because of the laborious methods commonly used to calculate them.

A simplified method is herein described for obtaining volumetrically weighted averages of reservoir data. It is usually more rapid than weighting by areas. The method is based on the application of geometrically constructed polygons and has been used by the mining industry for a number of years to find the quantity and average assay value of an ore body from sample data.[1]

The polygon or polygonal prism method (the third dimension of the prism is the thickness of the reservoir) involves the construction of polygons around wells on which data are available for application to the reservoir under study.

*Supervising Engineer, Bureau of Mines, Dallas.

The first step in constructing polygons is to draw lines joining each well to each adjacent well, thereby forming a series of triangles. Lines are then drawn from the apexes of the triangles to the centers of the opposite sides; in each triangle the three lines intersect at a common point, which is the centroid of the triangle. (See triangle ABC in Fig. 1).

The lines from the centroid to the midpoint of each side are the significant lines for the construction of the polygons and divide the triangle into three equal areas, each of which forms a part of the polygon assigned to the well at one of the corners. The heavy lines in Fig. 1 illustrate a series of polygons constructed for an oil reservoir.

When using the polygonal prism method for weighting purposes, the average of any data measured at a well bore is assumed to be representative for the prism constructed around the well.

The method of constructing a polygon is based on the hypothesis that reservoir data from well to well vary as a "straight line" function of distance, and that a variable at any point within a triangle formed by three wells is influenced by the value found in all three in inverse ratio to the distance from each.

The geometrical construction of the polygonal prisms should be such that this assumption will produce a result as nearly as possible in accordance with actual conditions. For example, when forming the large triangle by connecting each well to each adjacent well, the choice of wells to connect is sometimes optional; then the shortest lines should be drawn, as illustrated in Fig. 1 by drawing a line from A to C instead of from D to B.

If this method is followed, errors due to personal interpretations will be eliminated, and the polygons can be reproduced by anyone.

As dry-hole data are not always available to complete the polygons around the edge wells, the limits of the reservoir must be found by extrapolation, as in constructing an ordinary isopachous map. Once this has been done, the polygons surrounding the edge wells can be completed by assuming that dry holes exist at convenient points along the periphery.

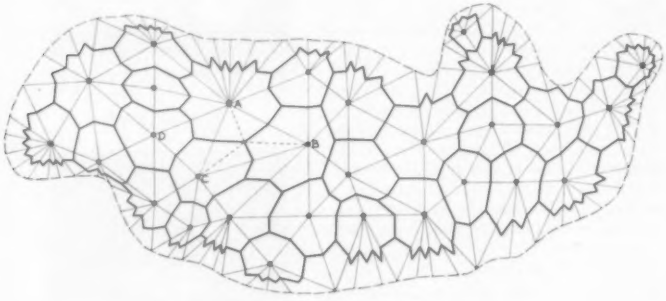

Fig. 1—Polygon map of an oil reservoir.

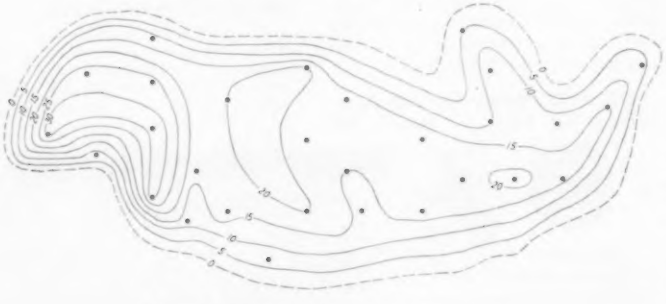

Fig. 2—Isopachous map of an oil reservoir.

Application of Method

To illustrate application of the polygon method for computing reservoir volume, the method is applied to a small oil reservoir. The total volume of the reservoir, calculated by this application, is in close agreement with the volume calculated by the generally accepted isopachous method.

Applying the polygon method to this reservoir, the volume was computed to be 18,710 acre-ft. Using the same basic data, an isopachous map was constructed as illustrated in Fig. 2, and a volume of 19,200 acre-ft. was calculated. Comparing the two values on a percentage basis, the polygon method gave a volume 2.5 per cent lower than that computed from the isopachous map.

The preceding comparison is representative of how the polygon method will compare with the isopachous method for obtaining volume estimates, and it follows that the volumes

of these polygons can be used to advantage in obtaining volumetrically weighted reservoir data.

Probably the greatest need for making volumetrically weighted averages of reservoir data is in averaging reservoir pressure. This is particularly true when reservoir-pressure data are used to evaluate the effectiveness of a water drive or a pressure-maintenance program, or when material-balance methods are employed to calculate petroleum reserves.

The volumetrically weighted reservoir pressure is found by obtaining the summation of the products acquired by multiplying the volume of each polygonal prism by its reservoir pressure and dividing this sum by the total polygonal prism volume of the reservoir.

Advantages

The chief advantage of the polygon method over other methods for obtaining volumetrically weighted reservoir pressures is in the time saved when these calculations are made at repeated intervals of time.

The first time the polygon method is used to obtain an average of reservoir pressure, approximately the same length of time is required as that to obtain a volumetrically averaged value by superimposing an isobaric map over an isopachous map and weighting the areas falling between the isopach and isobar lines. However, on succeeding pressure surveys, the same polygon map can be used and volumetric averages obtained in less time than normally is required to planimeter an isobaric map to obtain an areally weighted average pressure.

In addition, the same polygons are used to obtain volumetrically weighted averages for porosity, permeability, interstitial water, residual oil, and other reservoir characteristics.

Unfortunately, such data as reservoir pressures often are not measured on the same wells each time a survey is made. This does not call for the construction of new polygon maps, however, because the individually measured reservoir pressures can be extrapolated between wells in the areas where no measurements were made.

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1. Jackson, Chas. F., and Hedges, J. H., Metal-Mining Practice: Bureau of Mines Bulletin 419, 1939, p. 68.

Rocky Mountain "Hot Spot"

(*Continued from page 201*)

has to date produced well in excess of 400,000 bbl. of oil and still has a potential of about 500 bbl. daily.

Red Wash Field

Credit for the Uinta basin's second discovery goes to The California Co. at its Red Wash unit in the extreme northeastern corner of the basin. Thus far a total of 10 wells have been completed and 4 are still drilling. No dry holes have yet been drilled in the field and no wildcat attempts have been made in the immediate vicinity of the unit. Unlike Roosevelt, production at Red Wash is from a more conventional reservoir consisting of a series of comparatively thin sands near the base of the Green River.

Although the development program has expanded to cover an area of nearly 3 sq. miles it has not gone far enough to give us a definite and complete structural picture. Again the available control shows only a gentle, northwest plunging nose. With no more control than is available, the fact that no dry holes have been drilled, and the complete lack of long stepouts, we can no more than speculate on the possible extent of this pool. (See Fig. 5).

Production at Red Wash is from a depth averaging between 5,000 and 5,500 ft. The oil is generally the same type as that produced at Roosevelt although the gravity is slightly lower, about 29° to 30°. It is interesting to note that in the three fields currently producing the oil gravity and qual-

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ity increases both with depth of burial and lower stratigraphic position.

Duchesne Field

The Duchesne discovery came in late summer of last year and since only the discovery well has been completed we are unable to show any structural picture based on subsurface data.

Flow of Oil and Water In Porous Media

(*Continued from page 180*)

microscopic picture of the paraffin cast of the pore structure of a salt core. The range covered for two-fluid flow is 9.2 to 44.7 per cent paraffin saturation.

Simply by coloring the paraffin as was done in all the runs, interesting saturation distributions may be observed using this technique. Thus Figs. 18 and 19 are the inlet and outlet ends respectively of a core that had been run without a mixing orifice.

The mixing that takes place is clearly indicated in these photographs where the dark-colored paraffin is much more evenly distributed at the outlet end than in the inlet end. The results in this case were different from all the others in which mixing orifices were used. Thus, without orifices the saturation was distributed so that each of the phases tended to occupy a region on either side of a line through a cross-sectional area.

With orifices, the tendency was for the saturations to find circumferential distributions. Even with orifices, however, some cores showed the saturation to be more evenly distributed over the cross-sectional area at the inlet end of the test section while others showed the distribution to be more uniform at the outlet end.

Discussion

It is realized that many drawbacks exist in this attack to the problem. The most important are:

1. It is possible that rearrangement of fluids may occur while the oil phase is being solidified.

2. Shrinkage of the phase upon solidification may give a change in fluid saturation or a rupturing of continuity.

3. Results are applicable only to that system studied since further knowledge of wetting properties, capillary force, etc., is lacking, and fluid properties may not be dimensionally in the desirable range.

Some of the more apparent observations require further confirmation by experimentation in additional systems. There is some question, for example, as to whether the circumferential saturation distribution might be caused by the differences in the viscosities of the flowing fluids in conjunction with the design of the test assembly in which the inlets and outlets are in the center portion of the flow system. If this were the determining mechanism, the fluid of higher viscosity might be expected to flow through the most direct channels in the center.

Another question relates to the efficiency of the mixing heads. The results in this regard are not conclusive and it would be desirable to explore additional methods of mixing the fluids before entrance into the test section. For these reasons, it is not recommended that these observations be interpreted as a complete and true picture of the behavior of natural petroleum reservoir systems. However, it is felt that this approach shows promise and should be pursued further.

The results of this study point to the desirability of a critical examination of some of the techniques presently taken for granted in fluid flow studies. In no case observed was there a complete homogeneity of fluid distribution. In most cases very definite broad channels, high in saturation of the wetting phase (glycerin), were evident. Even the use of three sets of inlet orifices failed to give a complete distribution of the two phases throughout the test specimen. In some cases these broad channels were not evident at the inlet face but were apparent at the outlet face.

In most cases the channels were meandering and in all observations

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it appeared that the lucite wall was preferentially wetted by the paraffin phase. This in itself points to an undesirable condition in flow work where the wetting properties of the bounding walls differ from those of the porous matrix. Reference to Fig. 14 indicates that this is a real effect. Core VI, contrary to the procedure with the other cores, was initially saturated with glycerin rather than paraffin. This notwithstanding, the preferential wettability of the lucite by the paraffin was apparent.

In spite of the existence of channels wherein the glycerin saturation was extremely high, there were indications that the glycerin was the wetting phase throughout the entire core as illustrated by the increase in size of the holes within the paraffin network as the paraffin saturation decreased. Most of the paraffin saturation remained as a continuous network over a large range of saturations, but at least part of the paraffin was held in discrete globules or threads as indicated by the collection of loose paraffin fragments from the effluent stream shown in Fig. 20. It is estimated that in all cases these loose fragments contained less than 10 per cent of the paraffin saturation.

In some cases small paraffin particles could be seen to be caught in the continuous paraffin network. In general, as the paraffin saturation decreased greater quantities of paraffin were dropped on the filters.

Some tendency toward the buildup of glycerin saturation at the outlet end of the test specimen was evident but not conclusively so. On one specimen run without end sections an increase of glycerin saturation was definitely apparent; but on those runs with end sections it could not be visibly ascertained.

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Acknowledgment

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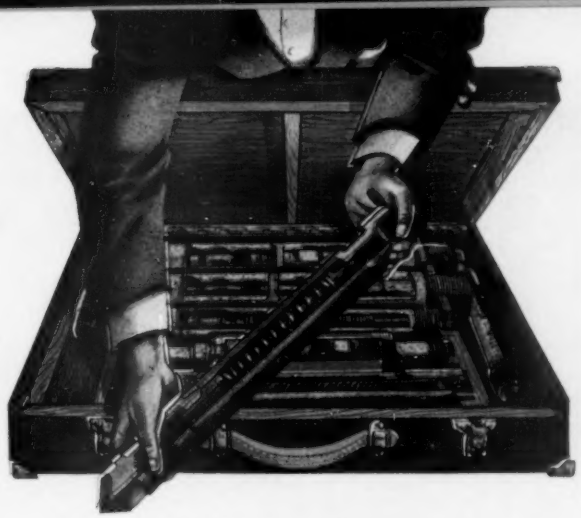

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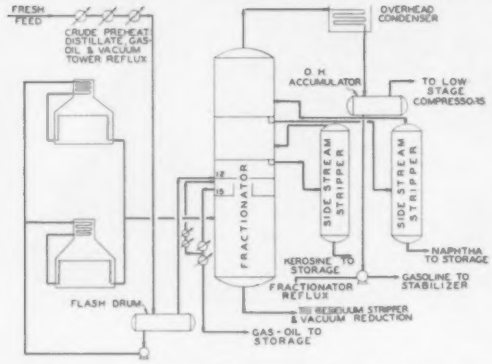
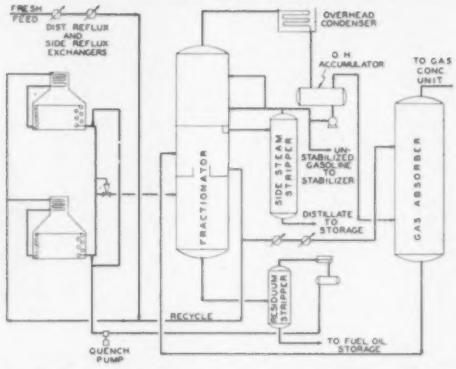
Authorized export dealer for Otis tools and equipment: Otis Pressure Control Export, Inc. — 6612 Denton Dr., Dallas, Tex., U.S.A.; Apartado 1706, Caracas, Venezuela; 1202 17th Ave. W., Calgary, Alberta, Canada



Flow diagram of thermal reformer used as crude unit.



Flow diagram of thermal reformer used in cycle-oil cracking.

Double-Duty Reformer

Thermal unit at Phillips Oil Co.'s Sweeny, Tex., plant used for both crude distillation and thermal cracking

FROM thermal reformer to crude unit, then back to thermal cracking, has been the history of the reformer at the Sweeny, Tex., refinery of Phillips Oil Co. Latest phase finds the unit serving a dual purpose—usually operating as a thermal cracker but with provisions for switchover to a crude unit when necessary.

The changeover in the operations of the reformer has matched the development of the refinery from a wartime aviation gasoline plant to a complete refinery producing a full range of salable products.

Reformer.—The reformer was originally installed in the J. S. Abercrombie-Harrison Oil Co. plant during World War II. The plant was designed and operated for the Government for aviation gasoline and blend-stock operation. The reforming unit was operated to produce a maximum of butylene feed for the HF alkylation unit by severe reforming of naphtha at a charge rate of 8,000 bbl. per day. Original equipment consisted of dual center-wall, updraft-type furnaces operating at 1,000-psi. outlet pressure, one fractionator and one gas absorber, both designed for 225-psi. operating pressure, and a fuel-oil flash stripper.

When Phillips took over the plant at the war's end and began operating the refinery for a full range of distillates for market, little use was found for the reformer as such except when market conditions made it economic to convert naphthas to motor fuel. Under these limited conditions, the unit was available for reforming kerosine distillate and naphthas.

At this time only one crude unit was in operation at the refinery and the decision was made to convert the reformer to a crude unit as a means of increasing plant capacity.

Supplemental crude unit.—In adapting the unit for crude processing additional heat exchangers were required for preheating the crude, and the addition of a crude flash drum was necessary to take some load off the furnaces. Some of the vapors are thereby flashed directly to the middle section of the fractionator.

Provisions were made for venting gases from crude operation to low-stage compressors at the gas-concentration unit serving the entire plant. The gas absorber was retired under this arrangement. Two strippers were added, however, to take sidestream cuts from the fractionator.

For efficiently operating the unit on crude it became necessary to increase topped crude reheat capacity, so a small vacuum tower and furnace were constructed to operate in parallel or series with the vacuum setup on the existing crude-distillation unit. When the reformer is used for thermal cracking, the vacuum tower and furnace are bypassed but are used to supplement parallel features on the crude unit.

With revamping completed, 14,000 to 16,000 bbl. of crude per day is processed, depending on the crude type.

Thermal cracking.—In recent months a new crude unit has been installed at the refinery, obviating the need for the reformer in crude service. To increase flexibility within the plant, reformer unit is now utilized to crack cycle oil. However, versatility of operation can be seen in the present arrangement, since cycle or gas oils can be cracked when the cat cracking unit is down or crude can be topped when a crude unit is down.

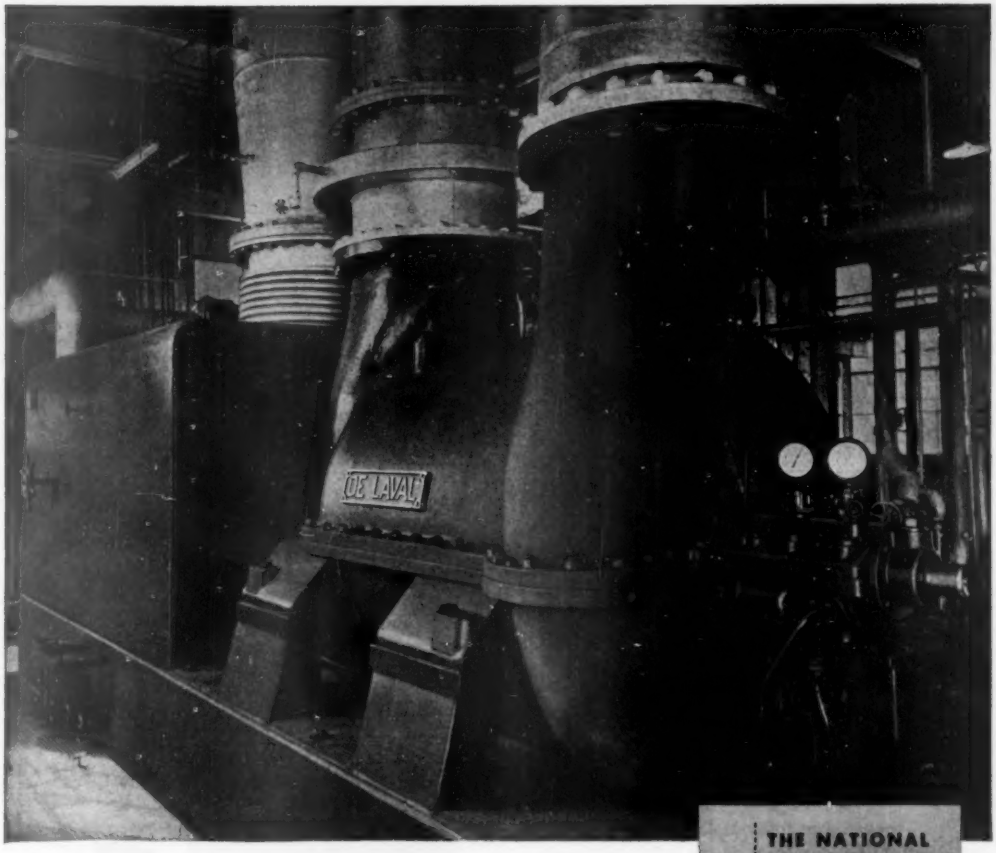
The crude flash drum is bypassed in cycle-oil cracking, and the cycle oil is fed directly to furnace, along with recycle stock from the fractionator. Only one sidestream stripper is in operation, although the absorber is back in service. The absorber operates at a low pressure and is used chiefly to reduce the load on the compressors at the gas-concentration unit. Operating conditions are such that the cycle oil is cracked under mild conditions in order to convert as much of the cycle oils to salable distillate as possible without incurring a high gas loss.

Operating conditions.—Used for heavy cycle-oil cracking, the reformer has a charge rate of 5,000 bbl. per day; for light cycle oil cracking the rate is 7,000 bbl. per day.

Operating conditions of the unit are:

Furnace:	
Outlet temperature, °F.	930
Pressure, psig.	650
Fractionator:	
Pressure, psig.	70
Absorber:	
Pressure, psig.	60

Products—	Fresh feed basis
Total C_4 and lighter gas yield, wt. per cent	7-8
Butane-free gasoline yield, vol. per cent	35
Distillates, vol. per cent	40
Fuel oil, vol. per cent	17



This blower never takes a "breather"

at THE NATIONAL COOPERATIVE REFINERY ASSOCIATION

There's no time out for this De Laval turbine-driven blower at the McPherson, Kansas fluid catalytic cracking plant of the National Cooperative Refinery Association. Twenty-four hours a day this 21,500 cfm, 2,270 hp unit handles air for regeneration of the spent catalyst.

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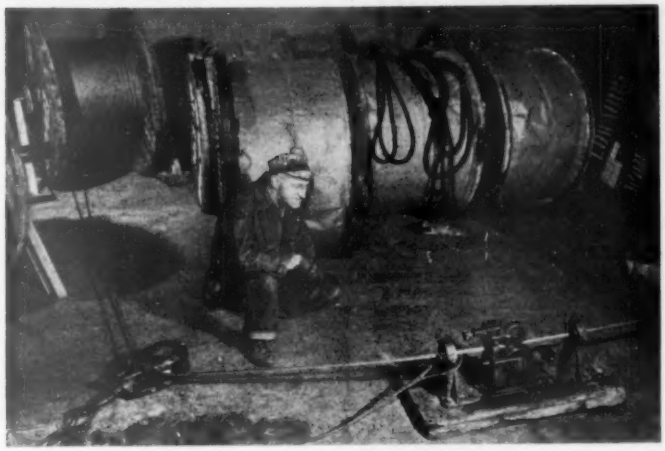


Efficient Handling of Wire Rope

PROBLEM . . . How to move quickly large spools of wire rope to fill will-call orders.

SOLUTION . . . By an ingenious arrangement of blocks and pulleys activated by the winding machine, rope is drawn off otherwise inaccessible reels and around intervening objects without moving any of them (see picture).

Republic Supply Co. of California uses a series of heavy staples set into the floor at strategic intervals and below the floor level. To these snatch blocks are hooked as required by location of the wire-rope reel needed. Several blocks are often required to bypass intervening reels.

From the spool and through these blocks the rope is drawn through a counting machine on the floor by a special winding machine, designed and made by the company. On this machine a delivery spool is placed on a horizontal spindle where it engages a finger which fits into a hole on the delivery speel flange to furnish leverage for winding.

Power is applied and the operator reels off the required length of rope for delivery in a matter of minutes.

Portable Pipe-Vise Stand

A vise stand that can be knocked down or assembled quickly is used at the Artesia, N. M., refinery of Newmex for cutting and threading of pipe by maintenance crews.

The end on which the vise is mounted is an A-frame with wide spreading legs tied together near the bottom with a welded bar (see photograph).

Base is mounted on a square of boiler plate attached to both legs at the top by welding.

Welding to the underside of the plate, at the apex of the legs, is a short nipple carrying half of a heavy hammer-type union. The opposite end is attached to a long joint of pipe which in turn is attached to a single vertical leg. A second nipple welded to the long pipe carries a saddle to match the saddle on the vertical end piece. Both saddles are lined up with jaws of the pipe vise.

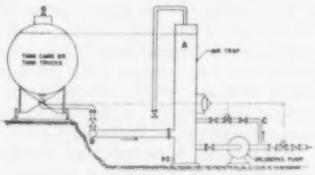
Quicker Unloading

Device prevents "gassing off" by unloading pump

IN order to provide a method for unloading tank cars or multiple-compartment tank trucks so that it is impossible for the unloading pump to "gass off" or to become filled with gas so that the pump and motor will not run wild, an apparatus has been devised which includes an air trap. Which also reduces hazard of fire and speeds up the unloading operation.

Developed by A. L. Hickerson, district engineer, gasoline department, Phillips Petroleum Co., Phillips, Tex., the idea was explained to the "Operating Kinks" session of a recent Natural Gasoline Association of America meeting. Hickerson's idea won first prize in Class B.

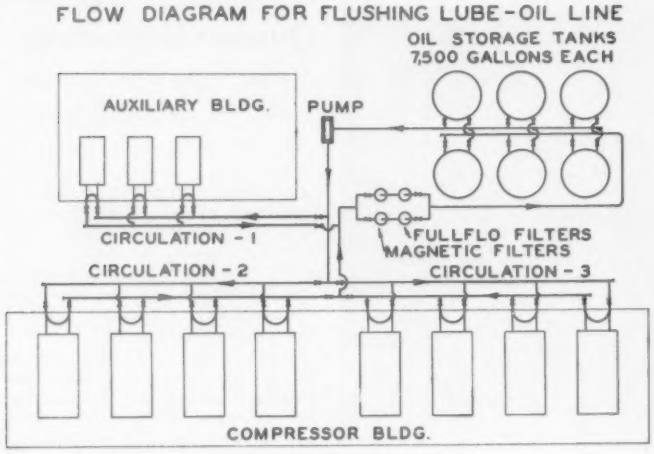
How it works . . . A vessel (see diagram) or air trap (A) is connected to



a header (B) which in turn is connected to the outlet connection of a number of tank cars or tank-truck-compartment outlets. The hydrocarbon being unloaded thus flows by gravity from header (B) into vessel (A). The unloading pump is connected into the bottom of vessel (A) discharging through a check valve, motor valve, and block valve into storage. A bypass line (C) discharges back into vessel (A) from the pump-discharge line.

A level control on vessel (A) controls both the bypass MV and the pump-discharge MV. When the level is high the bypass MV is closed and the discharge MV is open. When one tank car or compartment becomes empty, the level control automatically starts opening the bypass MV and closing the discharge MV, until all cars or compartments are empty. Then the bypass MV is wide open and the discharge MV is completely closed.

Thus this apparatus allows the completion of the unloading operation without gassing off the pump.



Cleaning Piping Connected To New Compressor Stations

CLEANING of new piping connected to new compressor stations, is expensive, E. E. Glendenning, Pacific Gas & Electric Co., Avenal, Calif., told a recent technical session of the Transmission Conference of Pacific Coast Gas Association at Berkeley, Calif.

Future plant down time and maintenance work can be kept to a minimum, he said, if the job is performed correctly and thoroughly at the time of initial installation.

The construction of a gas compressor station is one thing; to place the station in operation and keep it operating is another. Although construction and operation are two entirely different phases of the natural-gas industry, trouble-free operation depends to a great extent upon sound engineering during the construction period, and the application of practical experience in the preparation for operation.

The interior cleaning of engines, pumps, tanks, and the connecting oil, water, gas, and air lines are just as important as the sound engineering required for their installation.

Serious damage would result to an engine should an oil line, containing sand, pipe mill scale, or welding slag, be connected, permitting this foreign material to be circulated through the engine bearings.

In the Kettleman plant, one of three stations on the Pacific Gas & Electric Topock-Milpitas gas line, there are 80 oil, 107 water, 42 air, 28 fuel-gas, and 25 gas lines involved. The majority of the lines require interior flushing and cleaning to some degree.

The purpose of flushing and cleaning new compressor station piping is to effect complete removal of all dirt, mill scale, welding slag, and other foreign materials from all oil, air, fuel, water and gas piping and connected facilities. This is deemed necessary as an assurance against immediate or future damage to any piece of equipment connected directly or indirectly to any or all of the lines. It is recognized that most of the station equipment would sustain some damage should this material remain in these lines.

Our subject is the cleaning of the various service lines connected to the compressor engines; however, it must also be pointed out that it is just as important that engine crankcases, pumps, heat exchangers, air filters, pulsation bottles, air tanks, and similar equipment be given a rigid cleaning.

Flushing and Cleaning Oil Lines

The following procedure was utilized in flushing and cleaning the oil lines at the three compressor stations previously mentioned:

1. Cleaning of the oil-storage facilities and transporting lines is foremost in importance.

2. Starting at a point adjacent to each engine, all oil lines were blown with compressed air. The accumulated deposits were removed from the oil-storage tank.

3. The interior of the oil storage tank was cleaned with a wire brush, and washed down with a flushing type of oil. The tank was filled with clean flushing oil.

4. A pump of sufficient capacity (Fig. 1) to cause a velocity flow of at least twice the operating velocity of the largest line was connected to the system. The pump took suction from the oil-storage tank and circulated the flushing oil through the entire oil system, **but not the engine**, with return to the oil-storage tank.

Prior to reentering the tank, a parallel set of oil filters were installed. Each bank contained one magnetic-type oil filter with builtin screens, and one honeycomb - element - type filter. Each filter was of size sufficient to pass the fluid capacity of the oil circulating pumps. The honeycomb-type filter was capable of removing any foreign material in the 2 and 5-mc. size.

5. The circulating and flushing procedure continued until successive contrifuge tests of the flushing oil showed that no further foreign material was picked up (not less than 8 hours).

6. The flushing oil was maintained at a temperature 20° F. above the normal operating temperature of the line being subjected to cleaning.

7. The flushing oil was drained from the system and clean engine lubricating oil circulated in the same manner as the flushing oil.

8. Excess piping and filters were removed from the permanent piping, and permanent connections made to the engine.

If it is not possible or practical to clean all service oil lines connected to the engine at one time, the various loop oil systems can be cleaned in the manner discussed, individually.

The following results and conclusions were obtained as a result of utilizing the procedure as outlined:

1. Air purging of the lines is not sufficient in itself, and a flushing procedure is required. This is based on the fact that conservative estimates of the foreign materials removed by the filters amounted to 100 lb.

2. The use of the magnetic-type filter is desirable but not essential, provided the honeycomb element filter is protected by a screen-type filter.

3. The use of undiluted mineral oil for flushing is as effective as a 80 per cent mineral oil—20 per cent solvent mixture, unless the piping to be cleaned is known to contain quantities of pipe thread compounds, valve greases, resins, or other residue not affected by straight mineral-oil flushes.

4. The effectiveness and efficiency of the procedure are best proved by the test results obtained. Field centrifuge tests showed an unreadable trace of foreign materials remaining in the lubricating oil. Laboratory

analysis showed negligible contamination of the lubricating oil by the flushing oil, and contained only a trace of foreign material. Laboratory analysis of engine crankcase oil samples, after 1,000 hours of operation, did not show any additional contamination.

A "pickling process" has been used by various operators in cleaning oil lines. The results are not normally published; therefore, it woud be difficult to evaluate the effectiveness of the two procedures unless previous experience had proven one better than the other. However these seem to be the facts:

1. When oil lines have been pickled, it is difficult to remove the acid and caustic wash solutions.

2. Pickling will not remove all mill scale, and may loosen some that will be released during operation.

3. The process is reported to be difficult, expensive, and hazardous.

Cleaning Air Lines

The following procedure is recommended for cleaning air lines:

1. Starting at the terminus of each air line, purge each line in the direction of the air storage tank, using compressed air.

2. Clean accumulated deposits from the air-storage tanks.

3. Using air from the compressors and storage tanks, purge each air line to its terminus, using steady and surge-purge procedure.

4. Air lines are to be considered clean only when there is no visual or physical evidence of foreign materials being removed at the time of successive purges.

As a result of following this procedure, there has been no visual or physical evidence of foreign material coming from any of the air lines.

Cleaning Fuel Gas Lines

The following procedure is recommended for cleaning fuel gas lines:

1. Since it is not practical to reverse purge fuel gas lines, the line can be satisfactorily cleaned by high velocity gas purge methods, using steady and surge-purge procedures.

2. Fuel gas lines are to be considered clean when there is no visual or physical evidence of foreign material being removed at the time of successive purges.

Cleaning Gas Lines

The procedure for cleaning main gas feeder lines, headers, and laterals is, in general, the same as that recommended for fuel gas lines. The following exceptions are noted:

1. It may not be desirable to purge at high velocity through orifice-meter tubes, regulators, or scrubbers.

2. It may be desirable to use an inert gas plug.

3. Extreme caution should be exercised to avoid the ignition of the natural gas.

4. The station design will dictate, to a great degree, the final procedure utilized.

Cooling Water Piping

The following procedure is recommended for cleaning the engine jacket water piping:

1. Install a temporary jumper at each engine, between the jacket water "in" and "out" lines, so that water can be circulated through the system and back to the hot-well without being passed through the engine jackets.

2. Remove temporary piping, and make permanent connections after lines have been thoroughly flushed.

3. Drain flushing water and refill with clean water.

The lubricating oil, cooling-water piping can be flushed in a similar manner.

Secondary Lines

There are a number of secondary lines, such as water makeup, oil drain, scrubber oil makeup, fire water, and air filter oil lines that are not of major importance insofar as their initial cleanliness is concerned. These lines should be flushed or purged with the fluid or gas that is contained by the line.

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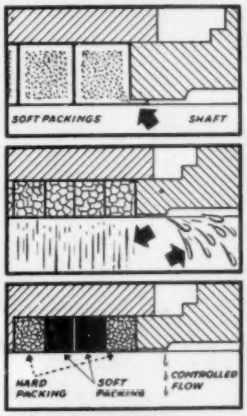

Straight soft packing used throughout permits end rings to squeeze into gland and throat clearances, thus sealing off the required amount of leakage needed to serve as lubricating film between shaft and packing.

Straight hard packing used throughout often is not sufficiently sensitive to gland pressure to control leakage within the desired limits. Also, the use of this single type of packing may result in scoring the shaft.

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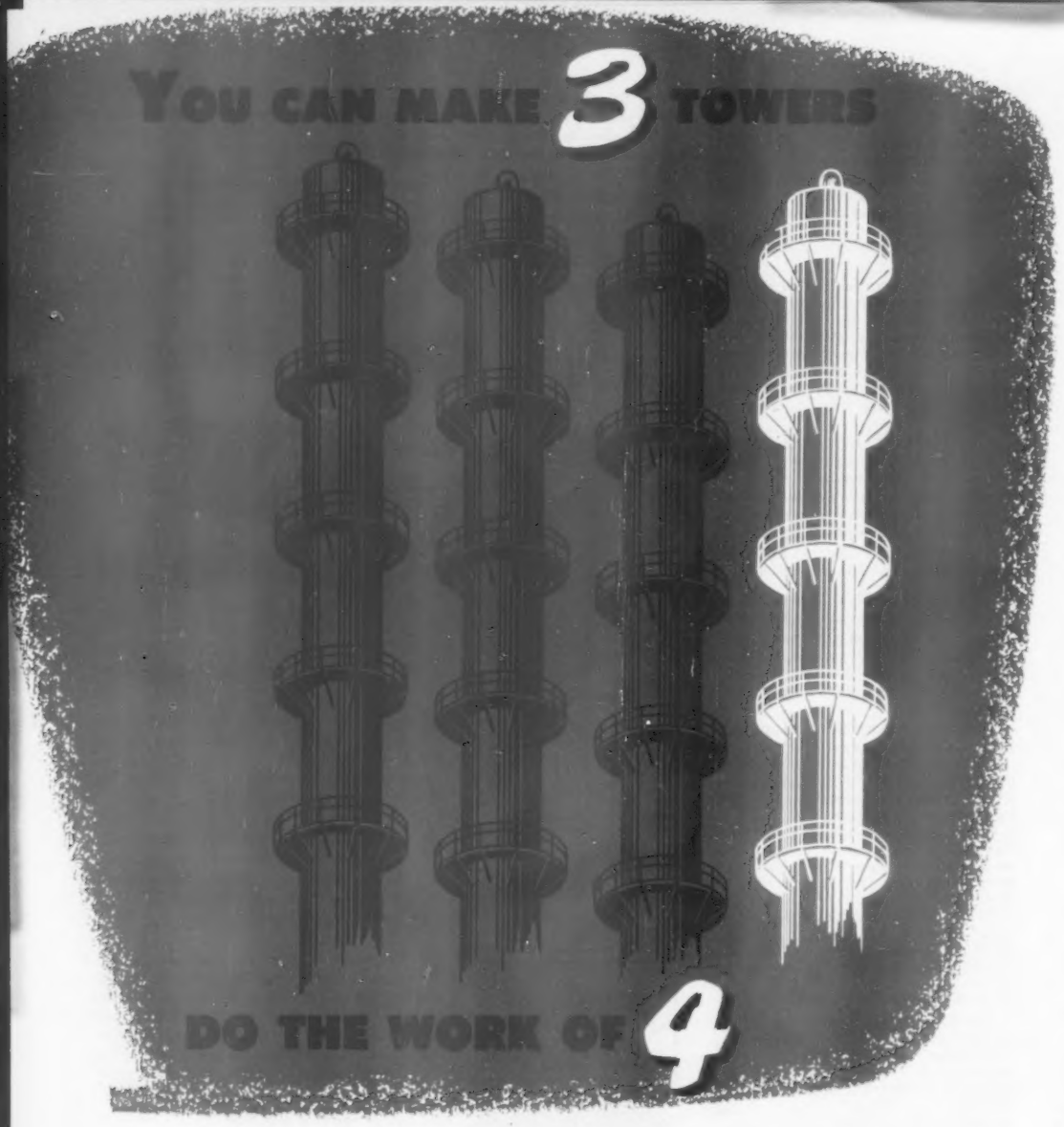

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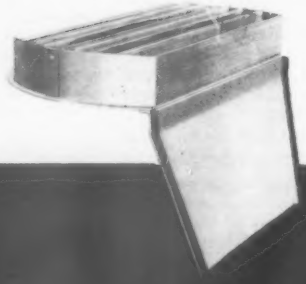

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VALVES are lubricated quickly, efficiently by new mobile units now in operation.

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A new type of valve-lubrication service for the petroleum and chemical industry has been introduced, which cuts time required by usual methods of about 8½ hours to 15 minutes.

High-pressure equipment in the mobile units is capable of delivering 180 lb. of lubricant per hour. The units, offered on a contract basis, afford flexibility, speed, and savings in labor. The service provides positive, efficient, low-cost valve lubrication, thus eliminating guess-work and haphazard methods.

The service is offered by Desco Service Co., a subsidiary of Delta Engineering Sales Co., Shreveport.

Easy Way to Get Across

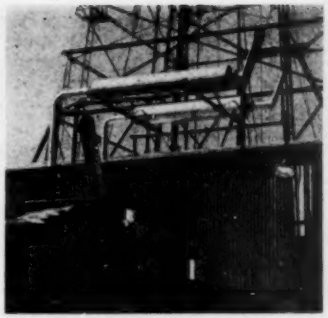
Field men can cross this barbed-wire fence easily to get to the liquid meter terminal on the products pipe line in the background, thanks to the ingenuity of Sinclair Pipe Line Co. personnel. The Caney, Kans., crew put pieces of old pipe, split underneath, around the barbs. Step in the foreground and walkway beyond fence of crushed stone makes the going that much easier.

Mufflers Set Above Shack

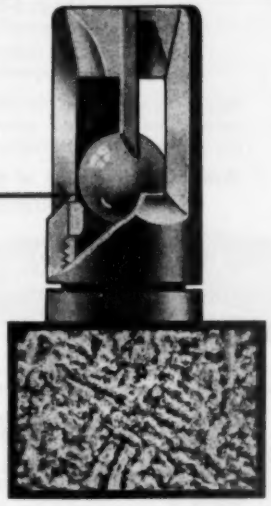
Mufflers for engines of drilling rigs can be installed on top of the rig building to cut down on heat, noise, and fumes.

The photograph shows a rig of K. L. Kellogg & Sons, drilling contractors, so adapted.

Structure supporting the mufflers is made of heavy tubing socketed into retainers attached to skid members of the engines. Risers are cross-braced at the top where the mufflers rest, and set into saddles to prevent movement.



Is this the seat of your pump trouble?



If you have a tough well that is down often due to valve failures, before you set a pump again ask your supply store for H-F Super Alloy Balls and Seats. The metallurgical properties of this Haynes Stellite® material are unexcelled in wear resistance qualities, the alloy is non-magnetic, unaffected by high temperatures, and guaranteed to be corrosion-proof to any known petroleum gas and/or fluid. The alloy (containing chromium, cobalt, and tungsten) is bonded into a very fine, dense grain structure *(see 200-x photomicrograph)* that makes the material extremely hard and efficient for abrasive fluids and hard pumping. Seats are individually mated to the balls, and each assembly is carefully inspected and tested before packaging in factory-sealed containers. Both the ball and the seat are of the same alloy, and sets are available in a full range of sizes in Regular and California types, with rib or flat seats (reversible). For your assurance of high quality, you can depend upon our more than 20 years' experience in manufacturing balls and seats for the petroleum industry. Next time specify Super Alloy . . . you'll settle on Super Alloy for all your wells.

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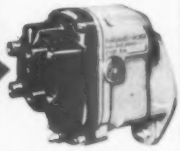

No need to worry about ignition failure on your pumping engines when they're equipped with Fairbanks-Morse Super Spark Magnetos—just start the engines and walk away—Super Spark Magnetos rarely need attention or maintenance. Peak performance during long periods of rugged oil field service is assured. Super Spark Magnetos are built for a rough job. Compare these features:

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THE JOURNAL'S WEEKLY
Engineering Reference
SECTION

No. 8

PUMPS:

Part 8—Pumping Viscous Liquids

by Gerald L. Farrar
Engineering Editor

THE subject of pumping viscous liquids with reciprocating pumps was developed in the last installment. Use of other pumps in this application is discussed here.

Centrifugal pumps . . . Most centrifugal pumps are rated on water-pumping applications. To convert these ratings to viscous oils, three curves are shown. These correlations are based on test data accumulated over 13 years from various sources. Various water-peak efficiencies are shown as parameter on the curves; thus manufacturer and type variation are taken into account.

As example of use of these data, suppose a centrifugal pump now in storage is rated as follows:

Capacity, 600 g.p.m. at 250 ft.

Peak efficiency, 80 per cent efficiency at operating point.

Efficiency at operating point, 76 per cent.

It is desired to use this pump for transporting oil of 1,000 S.U.s. viscosity and a specific gravity of 1.0. What are the maximum head and capacity at the operating point, and what are the power requirements at this point?

From Fig. 1, the capacity correction factor is found to be 0.92 and from Fig. 2, the head correction factor is found to be 0.91. The peak efficiency is found to be 57 per cent from Fig. 3.

Capacity = 600 × 0.92 = 552 g.p.m.

Head = 250 × 0.91 = 227.5 ft.

Efficiency at operating point = 57 × 76/80 = 54 per cent.

$$\text{Brake horsepower} = \frac{552 \times 227.5}{3{,}960 \times 0.54} = 59.$$

Continuing these calculations for other operating points, and comparing with the pump characteristic curves for water, the curves in Fig. 4 are obtained. Losses attributed to increased viscosity are clearly indicated.

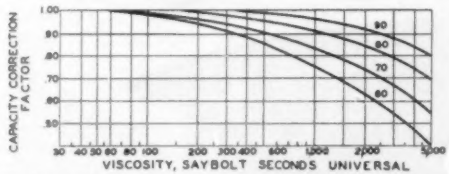

Fig. 1—Capacity-correction factor for pumps with water-peak efficiency as marked, for capacity at best efficiency point.

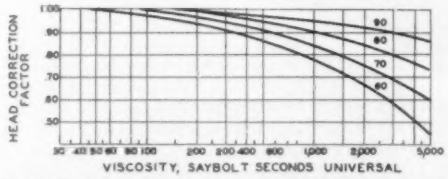

Fig. 2—Head-correction factor for pumps with water-peak efficiency as marked, for head at best efficiency point.

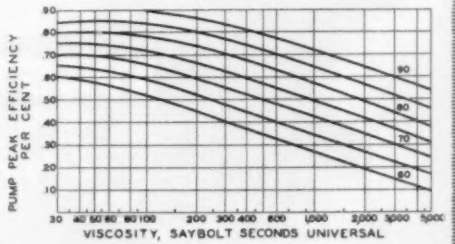

Fig. 3—Efficiency correction for centrifugal pump, peak efficiency for water corrected to that for petroleum oil of various viscosities.

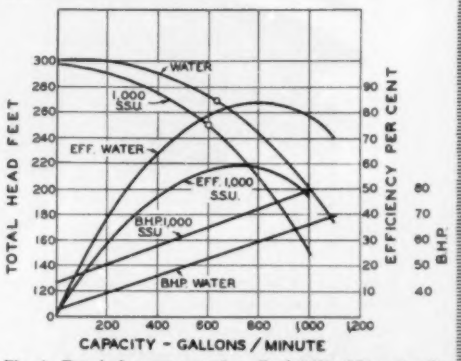

Fig. 4—Four-inch pump pumping oil of 1,000 S.U.s. viscosity, at 3,550 r.p.m.

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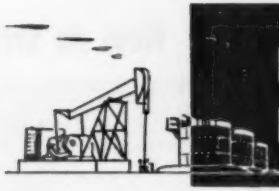

Pipe Lines in Series and Parallel

by Ralph F. Nielsen*

WHEN applying the usual pipeline formulas (Engineering Fundamentals No. 482) to systems of various diameters and lengths in series and parallel, the concept of "equivalent length" is convenient. The equivalent length is the length of an assumed diameter that will carry the same load, under the same conditions, as a given length of some other diameter, or as several lines of different lengths and diameters in parallel. If, for instance, it is desired to apply the Weymouth equation to the system of Fig. 1, the pressures being known only at the two ends, the system is converted to an equivalent length of a single diameter which, for convenience, may be taken as 6 in., since two sections have this diameter. Recalling Weymouth's formula and the above definition of "equivalent length," the length of 6-in. line equivalent to the 12 miles of 5-in. is given by:

$$5^{5.33}/12 = 6^{5.33}/L \qquad (1)$$

or L = 30.6 miles. In general, $L_1/L_e = (d_1/d_e)^{5.33}$.

To convert several lines in parallel to the equivalent length L_e of a single line of diameter d_e we can write:

$$d_e^{2.67}/L_e^{0.5} = d_1^{2.67}/L_1^{0.5} + d_2^{2.67}/L_2^{0.5} + \text{etc.} \qquad (2)$$

The length of 6-in. pipe equivalent to the loop of Fig. 1 is therefore given by:

$$6^{2.67}/L^{0.5} = 4^{2.67}/9^{0.5} + 3^{2.67}/8^{0.5} \qquad (3)$$

or L = 35.5 miles. (The numbers in Fig. 1 are assumed to be actual internal diameters.) The whole system is then equivalent to 30.6 + 10 + 35.5 + 6 miles of 6-in. pipe.

The alignment chart (Fig. 2) shows equivalent lengths for a number of A.P.I. regular pipe sizes[1]). The lengths are relative, that is, the same number of decimals may be removed from the two columns being used. For instance, 2 miles of 5-in. are equivalent to 210 miles of 12-in.

Elbows and bends may be converted to equivalent lengths of straight pipe by reference to tables.[2]

If the Clark formula is used for computations, the exponent in Equation 1 becomes 4.85 and those in Equation 2 become 2.62 for the d's and 0.541 for the L's.

References

1. Spang-Chalfant, Engineering Data.
2. Spencer, Natural Gas Engineering, The Pennsylvania State College.

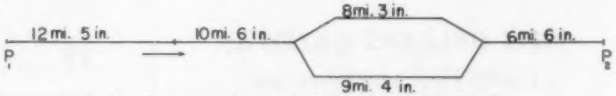

Fig. 1—Pipe-line system for development of equivalent length concept.

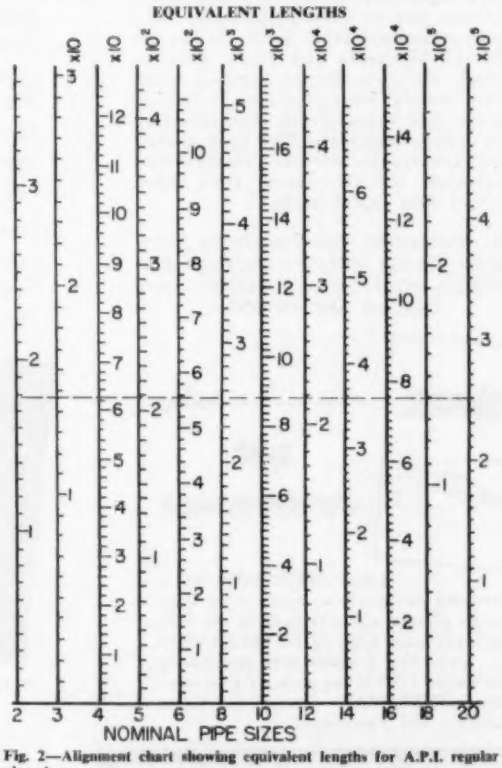

Fig. 2—Alignment chart showing equivalent lengths for A.P.I. regular pipe sizes.

*Associate professor, petroleum and natural gas engineering, Pennsylvania State College.

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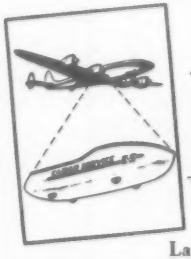

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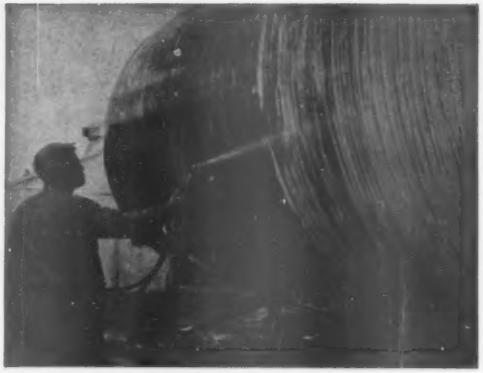

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QUESTIONS ON TECHNOLOGY

by W. L. Nelson
Technical Editor

Viscosity of Cracked Pitches or Fuel Oil

"Cracking yield formulas are usually stated in terms of A.P.I. gravity of the cracked fuel oil, but our specification is Bunker C fuel oil which mentions viscosity at 122° F. What is the relation of viscosity to gravity?"—M. D. P.

The viscosity of cracked residues is not a direct function of gravity because different charge stocks are employed and because cracking may be conducted vigorously or only mildly. Cracked residues from distilled stocks (gas oil or naphtha) are primarily polymerization products and they have low gravities and low viscosities (and low characterization factors). Such residues are indicated at the left of Fig. 1, and their gravities need not be higher than 3.5° A.P.I. Pitches from distilled charge stocks are sometimes as low as minus 3° A.P.I.

The rest of Fig. 1 applies to the cracking of reduced crude oils or black feed stocks. Low gravity residual feed stocks (10°-17° A.P.I.) cannot be thoroughly cracked (only viscosity broken) and the gravity of the cracked fuel oils produced by viscosity breaking ranges only from about 5° A.P.I. for pitches to about 12° A.P.I. when A.S.T.M. No. 6 fuel is made directly from the unit. Normal or regular cracking is represented by the center portion of Fig. 1.

Finally, (1) asphalt or naphthene-base feed stocks can be cracked to produce lower-gravity cracked fuel oils than mixed-base or paraffinic feed stocks, and (2) high-gravity feed stocks produce cracked fuel oils that are relatively rich in low-viscosity polymerization products, and can therefore be lower in gravity. Thus, whereas a 24° A.P.I. mixed-base (characterization factor of 11.9) reduced crude oil, when severely cracked, will yield fuel oils of 6°-7° A.P.I., a 30° A.P.I. reduced crude oil from the same parent crude oil will yield 5°-6° A.P.I. fuel oils. Had the feed stocks had a characterization factor of 11.4 (naphthene base), the cracked fuel-oil gravities would have been 4°-6° A.P.I. Even lower gravities can be produced by operating for a pitch and cutting back with gas oil.

Inasmuch as each plant is operated differently, it is necessary for the refiner to locate the viscosity of his cracked fuel-oil products on Fig. 1.

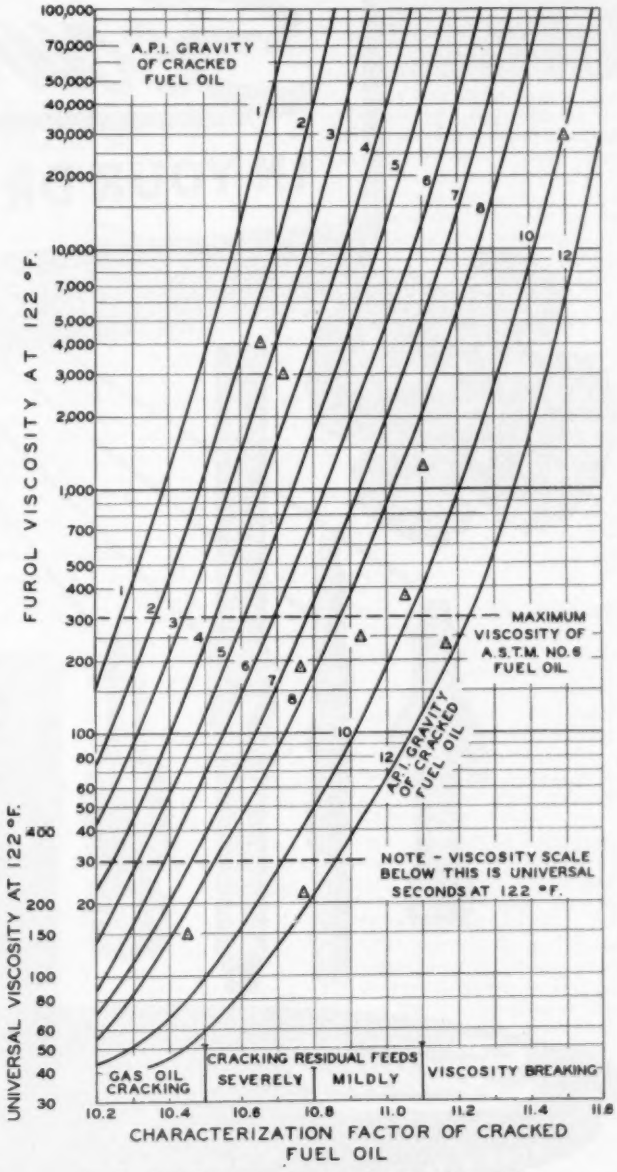
A.P.I. GRAVITY OF CRACKED FUEL OIL
FUROL VISCOSITY AT 122 °F.
UNIVERSAL VISCOSITY AT 122 °F.
MAXIMUM VISCOSITY OF A.S.T.M. NO. 6 FUEL OIL
A.P.I. GRAVITY OF CRACKED FUEL OIL
NOTE - VISCOSITY SCALE BELOW THIS IS UNIVERSAL SECONDS AT 122 °F.
GAS OIL CRACKING
CRACKING RESIDUAL FEEDS SEVERELY
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Fig. 1—Approximate viscosities of cracked fuel oils or pitches.

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How to Protect Storage Tanks—1

This is the first of a series of articles on internal and external protection of storage tanks. The entire series is from a paper by J. S. Cook, Humble Oil & Refining Co., Baytown, Tex., which was presented to a session on corrosion during the seventeenth midyear meeting of A.P.I., San Francisco.

Coal-Tar Coatings—Internal

COAL-TAR-BASE coatings have been used extensively for a number of years to combat internal corrosion of crude-oil tanks. Surfaces which have been protected include the bottom, lower 2 ft. of the first shell ring, as well as appurtenances in the lower part of the vessel. Coatings have not been applied to bottoms which were already extremely deteriorated. No attempt has been made to rely on a coating to eliminate existing leakage or to retain contents of a tank.

Coating materials consist of enamel, primer, thinner, and reinforcing material. The enamel should be of the type which has been processed to remove irritants and harmful ingredients such as coal-tar solvents, phenols, and naphthalenes. The reinforcing material is a lightweight open-weave glass-fiber cloth.

Inasmuch as material costs are essentially fixed, it is important to give close attention to methods of application, wastage, and job quality, because only along these lines is it possible to control expenditures to any appreciable degree. A first-class coal-tar coating must be obtained; otherwise the entire expenditure is likely to be lost. There does not seem to be any middle ground; i.e., the coating is either excellent or worthless.

Surface preparation . . . Areas to be protected are completely cleaned of all oil, grease, dirt, rust, mill scale, moisture, paints, and foreign substances. Initially, various cleaning methods were employed and, after considerable experimentation, the following was determined as most effective and economical:

1. Remove oil and grease with clean rags, utilizing cleaning solvents.

2. Employ sandblasting for removal of mill scale, rust, dirt, and similar matter.

On occasions, rusting of the sandblasted bottom occurs because of delays encountered between cleaning and priming operations. In such cases it is necessary to remove the rust; a pneumatic rotary buffer has proved effective for this operation.

Compressed air furnishes the power for this rotary buffer, shown here being used to remove rust from a tank bottom.

Priming . . . One coat of priming solution is applied by brush to the prepared surfaces (priming should, if possible, be performed immediately after the cleaning operation). The priming coat should be uniform and free of voids, holidays, runs, and flooded areas. Brush application is employed to assure complete coverage; to effect penetration into pits and crevices; and to eliminate sags, flows, and accumulations—especially in corners and along lapped seams. The long-handled 8-in. three-knot brush is efficient, and also allows the workman to be sufficiently removed from the solution so as to reduce the possibility of skin irritation.

Primer drying . . . Before the enamel is applied, the priming coat must be thoroughly dry and hard. Drying action depends upon atmospheric conditions, and the following tabulation is used as a guide:

Metal temperature (°F.)—	Min. drying time (hours)
35 to 50	48
50 to 80	24
80 and above	12

These general rules are followed, provided surfaces to be coated are not confined. For instances, in small tanks with only one manhole, where air currents are limited, somewhat longer drying times are necessary; and occasionally mechanical means, such as fans or blowers, are utilized to expedite the job. In such cases the coating must be tested to determine when proper drying has been accomplished.

Proper dryness of the coating can be checked by removal of a small quantity from the metal, and by pressing it tightly between the fingers. Dry primer will not become tacky or soft.

In the event the interval between the application of the priming solution and the enamel exceeds 5 days, a test such as the one described is made. Should the material be brittle and/or crumbly, the primer has become "dead," and the surface is reprimed before application of the enamel.

If the second prime coat becomes "dead" before enameling, the entire surface is thoroughly cleaned of all old primer before the application of a complete new priming coat.

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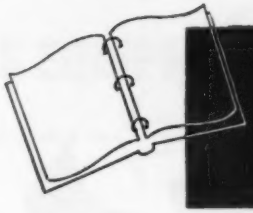

Cost Comparison . . .

. . . when setting relief valve below vessel design pressure

by S. Chesler* and B. W. Jesser†

NOMENCLATURE for Formulas 5, 5a, and 6 of No. 123, Refiner's Notebook, follows:

P_D = design pressure of vessel, psig.
P_s = set pressure of safety-relief valve, psig.
P_1 = absolute pressure of gas, psi. (upstream)
P_2 = absolute pressure of gas, psi. (downstream)
v_1 = specific volume of gas, cu. ft. per lb. (upstream)
K = coefficient of discharge for relief valves
W = weight of gas discharged, lb. per hr.
a = throat area of relief valve, sq. in.
k = ratio of specific heat, dimensionless

Example for Cost Comparison

The simple case of a single vessel 10 ft. in diameter operating at 10 psig. and releasing 160,000 lb. per hour of 300° F. and 62 molecular weight vapor to a flare 2,000 ft. away will serve to illustrate the savings that may be derived by following the above recommended procedure. Table 1 serves to summarize the results of this illustration.

If it is assumed that the normal basis for spread between operating pressure, P_O, and design pressure, P_D, is 10 per cent or 10 lb. whichever is greater, the design and set pressures for the conventional procedure will be 20 psig. The set pressure under all columns of the recommended procedure will also be 20 lb. By using Formulas 5 and 5a of No. 123, Refiner's Notebook, the maximum design pressure for the critical flow case is 27 and 24 psig. respectively. If a higher design pressure is desired, reference to Fig. 1, No. 122, Refiner's Notebook, indicates that it may be increased to 40 psig. without increasing shell thickness for the noncritical flow case. Accumulative pressure, P_A, is obtained by multiplying the design pressure by 1.1 or 1.25 respectively for the 10 per cent or 25 per cent systems. The back pressure available for the design of the discharge system is the accumulative pressure minus the set pressure. Critical pressure (gage) = 0.55 (P_A + 14.7) — 14.7. The line size and safety-relief valve area are calculated following conventional practices except that Formula 6 of No. 123 is used for the noncritical flow case.

Reference to Table 1 shows that for the 10 per cent system the size of the discharge line was reduced from 26-in. to 16-in. and the net total cost reduced from $46,900 to $24,800. For the 25 per cent system, the line size was reduced from 22-in. to 14-in. and the cost from $42,000 to $21,900. Experience has indicated that savings of this order are typical but naturally are a function of the extent of the discharge system.

In the case of vessels that lie to the right of the minimum thickness line in Fig. 1, No. 122, the same procedure with regard to a spread between set and design pressure may be applied but the savings in general are not as substantial. Normally the plot of vessel diameter versus design pressure on Fig. 1 will lie between two thicknesses. Since the tower will undoubtedly be purchased with the thicker plate, an increase in the design pressure may usually be obtained for the small cost of increasing the size of the reinforcing pads and the thickness of the tower heads. For example, an 8-ft. tower designed for 80 psig. requires according to Fig. 1 a corroded thickness of slightly over 11/32 in. which would require a 3/8-in. plate, corresponding to a design pressure of 85 psig. Therefore, if the set pressure is maintained at 80 psig. and the design pressure raised to 85 psig., then there will be an additional 5 psi. available for the discharge system. In some cases where one particular tower is the bottleneck in the design of a discharge system, it may be found economically feasible to jump a plate thickness by 1/32 in. or more.

TABLE 1—EFFECT OF SETTING RELIEF VALVE BELOW DESIGN PRESSURE ON MINIMUM THICKNESS VESSELS

	Conventional procedure		Setting valve below design pressure			
			Critical flow		Noncritical flow	
Designation†—	10%	25%	10%	25%	10%	25%
Operating pressure	10	10	10	10	10	10
Set pressure	20	20	20	20	20	20
Design pressure	20	20	27	24	40	40
Accumulative pressure	22	25	29.7	30.0	44	50
Back pressure	2	5	9.7	9.9	24	30
Critical pressure	5.5	7.1	9.7	9.9	17.6	20.9
Line size (in.)	26	22	18	18	16	14
Relief valve area (sq. in.)	50.7	50.7	42.3	45.4	33.4	33.4
Installed piping cost*	$46,900	$42,000	$34,500	$34,500	$23,400	$20,500
Incremental vessel cost	0	0	1,100	1,100	1,400	1,400
Total net cost	$46,900	$42,000	$35,600	$35,600	$24,800	$21,900

*Includes relief valves. †All pressures are psig.

*Piping engineer, and †head of piping analytical section, M. W. Kellogg Co. From paper presented at Toronto, Ont., A.S.M.E. meeting.

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4 PHILCO MICROWAVE COMMUNICATIONS SYSTEMS is the title of an eight-page attractive bulletin covering such subjects as microwaves at work, microwave radio relay link, and microwave antenna systems and equipment houses. *Philco Corp., Government & Industrial Division.*

5 WORM-GEAR SPEED REDUCERS, a 180-page catalog, illustrates and describes each model in complete line of Cleveland worm-gear speed reducers as well as worm and gear sets for built-in power-transmission applications. *The Cleveland Worm & Gear Co.*

6 TRIPLE-SPIRAL PARAFFIN REMOVERS. Bulletin No. 1150 describes Tripplehorn tension grip scrapers as a simple new paraffin removing device for pumping wells. Sketches show how these scrapers can be applied to sucker rods at well site. *Oil Well Supply.*

7 THE ACIDIZER is a data sheet which discusses method of application and results of photo-electric cell used for water locating. A diagram is given showing application procedure of this locator. *Dowell Incorporated.*

8 BOILER WATER LEVEL CONTROLS AND SAFETY DEVICES is a 24-page catalog designed primarily as a workbook to help in selection and application of safety devices for steam and hot water boilers, and heaters. Included are many specialized variations adapted for original equipment use, plus various components as they have been utilized for liquid-level control applications. Capacity curves, dimension drawings, and engineering data are included to guide proper selection. *McDonnell & Miller, Inc.*

9 MOTORIZED DRILL RIGS. Bulletin RM-705 describes, in eight pages

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Corresponding to new equipment items or trade literature abstracts in the Oil and Gas Equipment Digest of The Oil and Gas Journal, May 26, 1952

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of photographs and specifications, heavy-duty, truck or trailer-mounted portable rigs for slim-hole production and deep core testing. Model 350 has capacities to 5,000 ft. and Model 300 drills to 4,000 ft. *Joy Manufacturing Co.*

10 FILTRATION. Four-page booklet gives thumbnail description of standard models of Fulflo filters for microscopic clarification of industrial liquids and gases, and provides detailed descriptions of Honeycomb filter tubes. It gives essential data on single and multitube filters of capacities from 6 to 6,000 gal. per hour. *Commercial Filters Corp.*

11 KONTOL CORROSION PREVENTIVES for the refinery and gasoline plant is a six-page, two-color bulletin which discusses Kontols designed to prevent corrosion encountered in hydrocarbon distillation systems and to protect against attack by chlorides, sulfides, organic acids, or other agents. Application data with detailed drawings are included. *Tretolite Co.*

12 SELF-CLEANING PIPE-LINE STRAINERS, a four-page bulletin, describes complete line of these strainers made in sizes from ¼ to 3 in. An interesting discussion titled "Value of Sediment Control" points out numerous pieces of pipe-line equipment needing strainer protection, including steam traps, reducing valves, air tools, pumps, etc. Bulletin also contains complete specifications and prices. *Steam Specialties Division, The V. D. Anderson Co.*

13 CATERPILLAR D4 DIESEL TRACTOR catalog discusses a 43-drawbar-horsepower machine used in agriculture, construction, logging mining, and oil-field work. Catalog explains how tractor is built, and performance. Attachments and specifications are listed, together with more than 30 photographs and other illustrations. *Caterpillar Tractor Co.*

14 CENTRALIZED INSTRUMENTATION UNLIMITED. Bulletin 85-20, consisting of 32 pages, describes conventional and graphic type panel boards, as well as measuring and control instruments utilized. *Brown Instruments Div., Minneapolis-Honeywell Regulator Co.*

15 SHOVEL-CRANES. Catalog 2373 includes photographs, brief descriptions, and applications of 16 models of crawler, wheel, and truck-mounted equipment, ½ to 3-yard capacities, and 10 to 60 tons lifting capacity. *Link-Belt Speeder Corp.*

16 INDUSTRIAL STEAM TRAPS is a 12-page bulletin featuring steam traps equipped with bellows of bronze, monel, or stainless, and bodies in bronze, semisteel, and cast-steel construction in sizes ¼ to 2 in., for all pressures from vacuum to 300 psi. Capacity tables and dimensions are included, as well as recommended piping diagrams, typical applications, tables, and data covering selection of traps for various types of steam-using equipment. *W. H. Nicholson & Co.*

17 HOW TO USE SCHEDULE NUMBERS IN POWER PIPING DESIGN is a reprint of an article written by Sabon Crocker, of interest to pipe users, and particularly to users not familiar with derivation of schedule number system of designating pipe wall thicknesses. Charts are included for selecting pipe-wall thickness. *Taylor Forge & Pipe Works.*

18 ROCKRITE CYLINDER-FINISH TUBING. Bulletin R7 explains why Rockrite compression-formed tubing eliminates expensive machining of cylinder-bore or individual positions for clearance adjustments. Illustrated applications and a tolerance table are shown. *Tube Reducing Corp.*

19 BART LECTRO-CLAD PIPE AND FITTINGS. Brochure discusses Lectro-clad process used in every industry confronted with corrosion or contaminating problems. An enclosed tear sheet includes latest suggested welding technique from International Nickel Co. *Bart Manufacturing Corp.*

20 CEFARB-KOTE & BONMASTIC is a facts folder on two new concrete coatings extruded for high-density weight and soil corrosion. Material is waterproofed with Farbertite. *K.T.R. Coating Engineers.*

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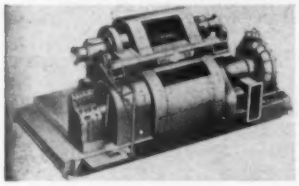
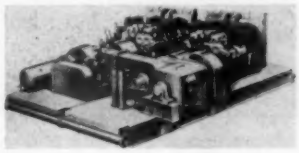
OIL AND GAS EQUIPMENT Digest

IT'S NEW ✓ CHECK IT

by Dan B. Miller

21 NEW IDEAL TYPE 55 CONSOLIDATED RIG is of sectionalized construction for use with two torque-converter-equipped engines having a combined input rating of 550 hp. It will normally be used for drilling in the 5,000 to 7,500-ft. depth range. The sectionalized construction affords design advantages, among them being the use of a large spooling drum, 22 in. in diameter and 49 in. long, grooved for use with 1⅛-in. wire line. This drum capacity permits usual hoisting operations with less than three full layers of line on the drum. Construction also permits transportation of the draw works and drive group in completely assembled, easily handled packages, with no need to disturb the factory built alignment of shafts, controls, and auxiliary brake. In addition to compound equalizing mechanical brakes, a choice is offered of either a Hydromatic or Dynamatic auxiliary brake as optional equipment. Drive groups are available for either high-speed or medium-speed engines with torque converter. *The National Supply Co.*



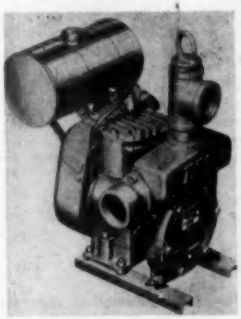


IT'S NEW ✓ CHECK IT

22 NEW DOUBLE-SEATED DIAPHRAGM REGULATING VALVE developed to meet all features required by the various process industries provides, as standard equipment, the "Flow-Line" contoured body. This has been designed to provide I.S.A. standard face-to-face dimensions with the highest capacity, lowest turbulence, and body pressure drop. The large bowl construction provides smoothly contoured, full area passages. Renewable interchangeable seat rings is another important feature of the new valve. These rings are machined so accurately that they can be removed and replaced without removing the valve body from the pipe line. An important feature where maintenance may be performed by inexperienced help is the renewable self-aligning guides. These top and bottom guides cannot bind regardless of bolt tightening because they are self-aligning. The main valves and seat rings of the new valve are furnished with stellited seating surfaces as standard. In steel valves the seat rings are eliminated and stellite is applied directly to the main body. Other trims without stellited seating surface are also available. The valve action is easily reversed in the field. It is not necessary to change or machine any parts. A flanged stuffing box is combined with a generous opening in the superstructure yoke, designed for quick and easy maintenance. *Leslie Co.*

IT'S NEW ✓ CHECK IT

23 NEW 2-IN. GENERAL-PURPOSE SPEED-PRIMER PUMP. The lightweight self-priming centrifugal has a semisteel impeller, and an adjustable peeler of high-carbon steel, replaceable wearing plate, and a leakproof seal. Large cover plates are easy to remove, making wearing parts completely accessible for quick and easy adjustment when necessary. Whether salvaging oil from a slush pit, removing water from the firewall embankment around oil-storage tanks, transferring oil direct from pipe lines and refineries, Rex Speed-Primers provide

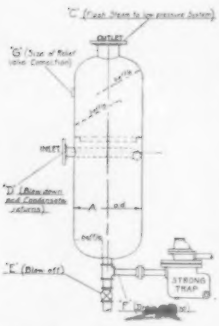


The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

Keep Informed. Save Time. Tear Out Card. Check It. Mail It.

maximum capacities with mud and debris-filled water, instant starting in cold and wet weather, and ease of inspection and maintenance against time limits. *Chain Belt Co.*

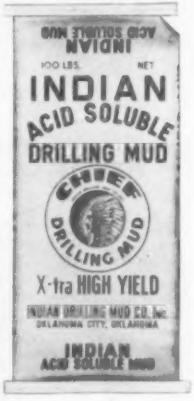
IT'S NEW CHECK IT



24 REFLASH STEAM SEPARATOR guaranteed to perform efficiently, is available in different sizes, and is easily installed. The discharge line from high-pressure steam traps is run into the separator with its vent line connected into the low-pressure heating or process steam line. Water that remains after reflash steam is removed may be returned to the boiler for reuse, put through a heat exchanger, or exhausted. The separator can be used in high-pressure condensate and continuous blowdown systems. *Strong, Carlisle & Hammond Co.*

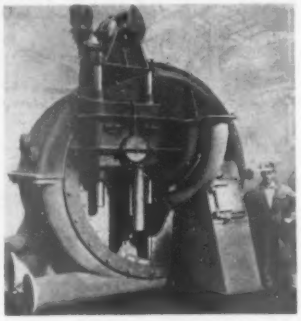
IT'S NEW CHECK IT

25 INDIAN ACID-SOLUBLE DRILLING MUD contains a special combination of mineral solids which has a solubility up to 98 per cent. Tight holes can be reduced to a minimum, as acid-soluble mud gives a thinner wall cake on the bore hole, thus lessening the hazard of sticking drill pipe. This product was used on a well in the Lindsay, Okla., area. Upon completion in the first Gibson sand, it flowed 542 bbl. of oil in 21 hours against ½-in. choke, after it was perforated and 500 gal. of mud acid was used. This is the only well producing from the first Gibson in the vicinity. All previous tests in the area were tight with small recoveries on tests with no natural recovery. *Indian Drilling Mud Co., Inc.*



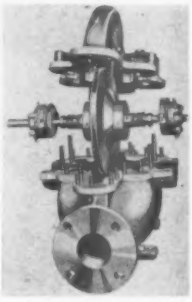
IT'S NEW CHECK IT

26 REINEVELD CENTRIFUGALS are used to separate solids from liquids or to separate two liquids. These machines have applications as centrifuges, as separators, and as classifiers in the chemical and petroleum industries. The standard Reineveld machines range in drum size from 36 to 80-in. diameter and operate up to centrifugal forces 1,500 times the force of gravity. This centrifugal offers mechanical and processing advantages because of its design with the main bearing located at the center of gravity of the rotating mass. This creates a high critical speed resulting in freedom from vibration. The improved filter bed and the higher available centrifugal force are especially efficient on difficult, slow-draining crystal separations or where organic impurities, clays, and other materials impede the filtering rate. A modification of a standard Reineveld machine can provide a totally enclosed, vaportight design which allows sodium cyanide, benzene and other inflammables to be handled with controlled atmospheres providing complete safety for personnel. *Heyl & Patterson, Inc.*



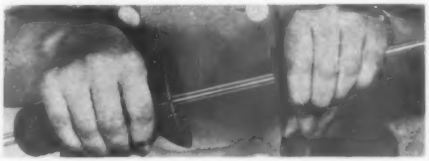
IT'S NEW CHECK IT

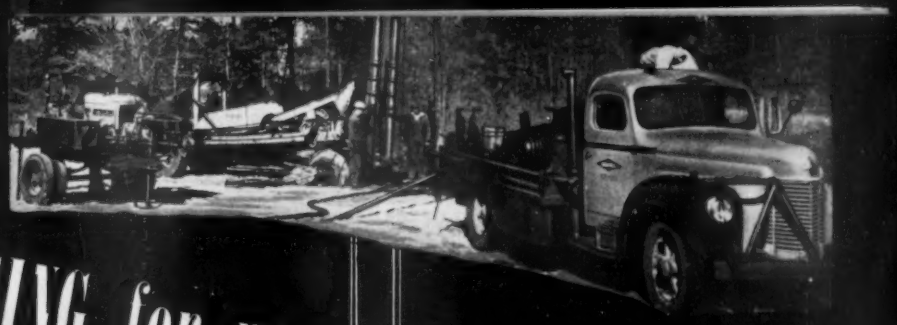
27 TYPE AS HORIZONTAL CENTRIFUGAL PUMP. The use of standard mechanical shaft seals, instead of conventional stuffing boxes, thereby obtaining savings in floor space, shorter shaft lengths, improved performance characteristics, and easier pump servicing, is the outstanding feature of a new line of horizontal, split-case, general-service pumps. This line of pumps is available in discharge sizes from 1½ through 4-in. Capacity range is up to 750 g.p.m. and head range is up to 230 ft. General application is for pumping water and clear liquids up to 200° F. where no solids are in suspension. By use of standard mechanical-shaft seals, the pump shaft is shortened to one-half the length of shafts in conventional pumps of the same size. As a result, the shaft is more rigid and shaft deflection is materially reduced. Seals used in this pump design are of standard manufacture and are avialable from standard sources of supply. *Peerless Pump Division, Food Machinery & Chemical Corp.*



IT'S NEW CHECK IT

28 NEW GRIP-SAFE TUBING MANIPULATOR. Inserting of glass tubes and thermometers in stoppers has always been a frequent cause of accidents in the laboratory. The Grip-Safe eliminates this hazard by providing a gentle, but firm gripping action which permits sliding the tubing into stoppers without the excessive or uneven pressure which breaks the tubing. Even if tubing breaks, Grip-Safe protects the hands, wrists, and knuckles from injuries. Accommodates most sizes of commonly used tubing as well





PLUGGING for more production!

WATER SHUT OFF to Increase Oil Production by Dowell Plastic Service

Water entry into an oil well can reduce production, increase lifting costs and waste reservoir energy.

A new well made considerable water on completion. Water Location Surveys made with the Dowell Electric Pilot revealed the point of water entry to be a top section close to the casing seat. Dowell engineers used plastic to shut off this water. First, gravel was dumped on bottom and capped with plastic to protect the lower producing section. After the cap had set, additional plastic was squeezed in the section between the cap and the casing seat. Following this, the plug was drilled through and the bottom section of the well was shot. Results were excellent . . . production was 240 BOPD *with no water.*

Many workover and recompletion jobs have been successful as a result of Dowell Plastic Service. Experienced Dowell engineers spot the plastic in the right place using specially designed bailers or tubing squeeze techniques. The plastic enters the well as a fluid . . . hardening to an impervious solid after a predetermined time. Dowell Plastics penetrate the formation producing a positive bond and providing a permanent plug against encroaching fluids. Dowell Plastic Service has also been used to good effect in correcting high gas-oil ratios, in setting liners and in consolidating loose sands.

Ask your local Dowell station or office for complete information on the many uses of Dowell Plastic Service in your well workover and completion programs.

DOWELL INCORPORATED
TULSA 1, OKLAHOMA
Subsidiary of The Dow Chemical Company

DOWELL

PLASTIC SERVICE

Ask your nearest Dowell Station for complete information on these Dowell services and products: Acidizing Service, Electric Pilot Services, Plastic Service, Chemical Scale Removal Service for heat exchange equipment, Jelflake, Paraffin Solvents, Magnesium Anodes for Corrosion Control, and Bulk Inhibited Hydrochloric Acid.

"First in Acidizing . . . since 1932"

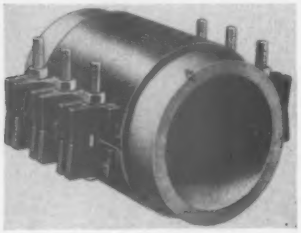
Look to DOWELL

FOR OIL INDUSTRY CHEMICAL SERVICE

as irregular shaped tubing such as T's and L's. May also be used to safely break tubing to desired length. *Labline, Inc.*

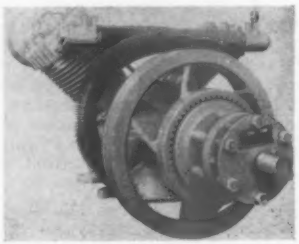
IT'S NEW CHECK IT

29 NEW HIPRESSURE LEAK REPAIR CLAMP. Designed for repairing corroded pipe sections, leaks, splits, and breaks which do not extend fully around the circumference of the pipe, the clamp is efficient, easy to install. Bolts slip through cone-shaped, extra-large bolt holes, then bolts are drawn up as needed to stop leak. Bolts never bend. Flexible corrosion resistant band assures permanent repairs even on out-of-round and damaged pipe. Clamp has neoprene-rubber gasket, is constructed with bands of 36-oz. heavy copper, 18-gage galvanized iron, or 20-gage stainless steel. Baker clamps are manufactured for all pipe sizes in widths 3, 6, 7½, 10, 12½, and 15 in. *R. H. Baker & Co., Inc.*



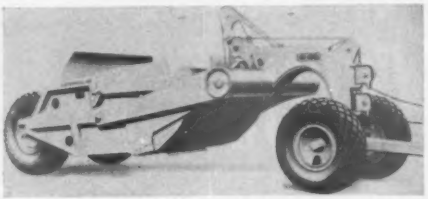
IT'S NEW CHECK IT

30 WICHITA ROTO-COUPLING. It is impossible for grit and sand to enter the bearing and sealing surface. A felt ring, which holds considerable oil, stops these abrasives and also keeps the sealing surface lubricated much longer. The O-ring seal also permits the carbon ring to move forward freely as wear occurs. Other advantages include a wide, copper sealing gasket, snap-type oil cup, and steel stem. The precision double-row ball bearing is protected by a labyrinth seal to keep out sand and grit. Available in ½-in. pipe size with 1-in. N. F. thread on stem for connection to shaft, and ¼-in. pipe size with ⅝-in. N. F. thread on stem. *Wichita Falls Foundry & Machine Co., Inc.*



IT'S NEW CHECK IT

31 NEW NO. 60 SCRAPER FOR USE WITH D6 TRACTOR POWER. The new unit has a flat-bottom bowl and stinger blade engineered for loading and finishing characteristics. The reversible blade cuts a 7-ft. 8-in. swath; the bottom is double with steel beam fillers. Capacity has been increased to 7 cu. yd. struck and 9 cu. yd. heaped. Top extensions or sideboards are available to boost this capacity to 8.3 cu. yd. struck and 11.5 cu. yd. heaped. Maximum carrying capacity is 11.5 tons. Also included are such design details as an unobstructed bowl, tapered roller bearings at the axles, induction hardened sheaves and bulldozer-type ejection. Operation is by means of a Cat cable control available for attachment to the tractor. *Caterpillar Tractor Co.*



IT'S NEW CHECK IT

32 WIRE FENCE COATING ROLLER. In developing new economical methods of fence application, a special, long-nap, lamb's-wool roller, thoroughly saturated with Rust-Oleum was used successfully. As illustrated, the roller is dipped into the container of material and the roller is pulled up on a flat board surface of approximately the same width as the roller to remove running surplus material. The roller is then applied to the area to be coated. Approximately 99 per cent of the material is used on the fence. At least 70 per cent of the other side of the fence is coated at the same time, due to the rolling action, and substantial amounts of materials on the wool. The time-saving factor is illustrated by the fact that the job is accomplished in about one-half the time needed with other methods. *Rust-Oleum Corp.*

IT'S NEW CHECK IT

33 CORROSIONPROOF OIL AND GAS-WELL TUBING. Recently developed self-sealing tubing joints, such as Hydril and Spangseal, open a new avenue to tubing corrosion control. Patented Bart Lectro-Clad Process deposits pure nickel on interior of tubing and on pin and box areas to affect a continuous pore-free barrier between gas or oil stream and parent steel tubing. The process offers advantages over many alloys since corrosion control is concentrated at the surface without affecting the structural characteristics of the parent steel tubing. *Bart Manufacturing Corp.*

IT'S NEW CHECK IT

PIPE LINES

100-Mile Outlet Planned For Denver-Julesburg Gas

DENVER.—Natural Gas Producers, Inc., an affiliate of Colorado Interstate Gas Co., Colorado Springs, Colo., has announced plans to lay a 100-mile, 12-in. outlet for gas in the Denver-Julesburg basin of northeastern Colorado.

The new line would extend from Yenter pool, discovered by British American Oil Producing Co., to Denver. It would also pick up gas from wells owned by Shell Oil Co., The Texas Co., Skelly Oil Co., Carter Oil Co., and others.

The company said actual construction will start during the third quarter, and the line will be completed before the end of the year. The Petroleum Administration for Defense is reported to have received favorably the firm's application for an allotment of 9,027 tons of steel.

The line is estimated to cost about $2,388,000 and to have a daily capacity of about 50,000,000 cu. ft.

Colorado-Interstate currently gets its entire gas supply from Panhandle field in northwestern Texas and Hugoton field in southwestern Kansas.

Amere Gas to Lay New Gas Line in West Virginia

WASHINGTON.—Amere Gas Utilities Co., Charleston, W. Va., has been authorized by the Federal Power Commission to lay about 34 miles of natural-gas lines in West Virginia to meet increased demands of present customers on its system.

The program involves laying of about 2 miles of lines in Wyoming County to reinforce the gas supply to Mullens, W. Va.; 17 miles of line in Mercer County to meet added requirements of Princeton and Athens, W. Va., and to supply gas to Bluefield Gas Co.; and 15 miles of line in Raleigh and Mercer counties to carry gas from Atlantic Seaboard Corp.'s Flat Top compressor station to Amere's existing line near Beckley, W. Va.

The latter line will permit the company to carry gas for Atlantic during off-peak periods and also to take gas during peak periods from Atlantic for

Getting a Lift

Stringing truck gets "hand up" rugged hills of West Virginia where H. C. Price Co.'s No. 2 spread is laying a section of 30-in. natural-gas pipe line for Texas Eastern Transmission Corp. Price has two spreads on the job—one working east from the Ohio River, the other working west. Headquarters for this spread is in Moundsville, W. Va. Superintendent is R. K. Shivel.

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★ PIPE CLEANING AND PRIMING MACHINES

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★ BENDING MACHINES

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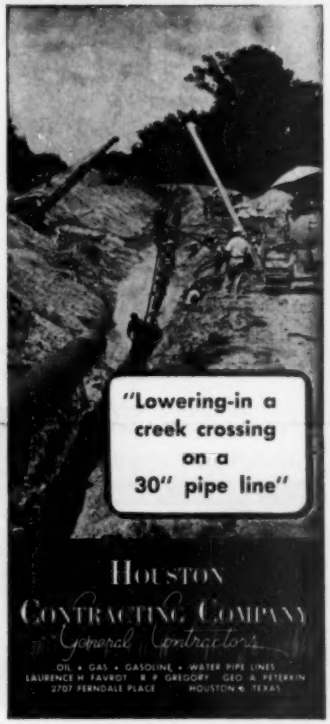
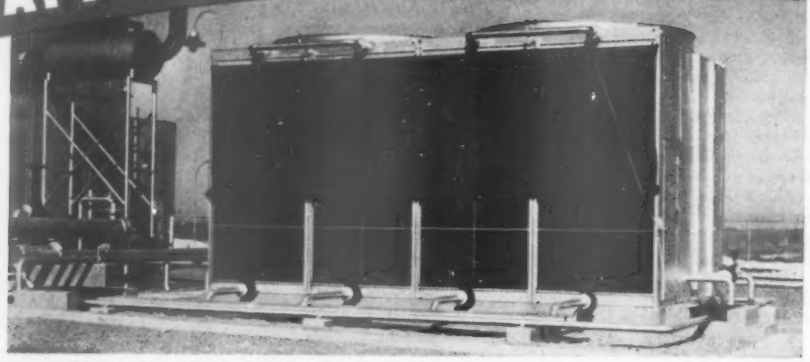


HOUSTON CONTRACTING COMPANY
General Contractors
OIL • GAS • GASOLINE • WATER PIPE LINES
LAURENCE H. FAVROT R. P. GREGORY GEO. A. PETERKIN
2707 FERNDALE PLACE HOUSTON 6, TEXAS

PROBLEM: To design a complete cooling package for an isolated compressor station. To require minimum attendance. To cool two services; Jacket Water and Lube Oil.

SOLUTION: HAPPY Cooling Engineers recommended this practical solution: One VIF 200-2, two fan unit, to cool water from 165°F to 130°F, part of this water to be circulated through a lube oil heat exchanger. Power to be supplied to fans from a hydraulic system driven from the compressor engine.

A HAPPY COOLER is the ANSWER



THIS PRACTICAL SOLUTION

- Eliminated recirculation of hot air by use of induced draft design. This is particularly important where cooling to close approach of air temperature.
- Eliminates need for auxiliary power. Cooler designed for low fan horsepower demand.
- Provides automatic fan speed control to eliminate manual temperature control.
- Provides two fan reliability to reduce down time.
- Provided low erection cost through simplified design and piping arrangement.
- Can be easily extended at later date to include additional engines.

If you are troubled by a cooling problem call or write THE HAPPY COMPANY. Their cooling engineers will provide a practical solution.

SERVING FOR. . .

BWH Industrial Hose
Happy Coolers
Rubber Belting
Leather Belting
Bull Dog V-Belts
Sure-Grip Sheaves
P & H Engine Starters
Safety Switches
Happy Pumping Units
Power Transmission Equipment

The HAPPY COMPANY
Formerly HAPPY BELTING COMPANY
TULSA, OKLAHOMA

33 HAPPY YEARS

BRANCH STORES:

Seminole ..... Oklahoma
Salem ..... Illinois
Odessa ..... Texas
Ellinwood ..... Kansas

DISTRICT REPRESENTATIVES:

Dallas ..... Texas
Kilgore ..... Texas
Pampa ..... Texas
Wichita Falls ..... Texas
Wichita ..... Kansas

5-MICRON
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PIPE SADDLES

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service to Amere's Beckley - Mullens market area.

Cost of the facilities is estimated at $802,340. Construction will be financed by Columbia Gas Systems, Inc., Amere's parent firm.

P. G. & E. Looping Program Set Back by FPC Delay

SAN FRANCISCO.—Pacific Gas & Electric Co., which daily is bringing into this area some 400,000 M.c.f. of gas through its 500-mile trunk line from Topock, Ariz., is proceeding with plans for 140 miles of loops on the 34-in. line.

Because of a delay in the FPC hearing on the company's proposal, however, it is believed unlikely that any pipe will be fabricated for the project until the fourth quarter.

P. G. & E. received a substantial third-quarter allocation of line pipe, but none was for the looping project. All of it is scheduled for routine expansion projects at many points in the company's distribution and transmission system.

Texas-Ohio to Fight FPC Dismissal Order June 6

WASHINGTON. — Texas-Ohio Gas Co. will resume its fight here June 6 to secure Federal Power Commission approval of its plans to build a big-inch natural-gas-transmission line from Texas to West Virginia.

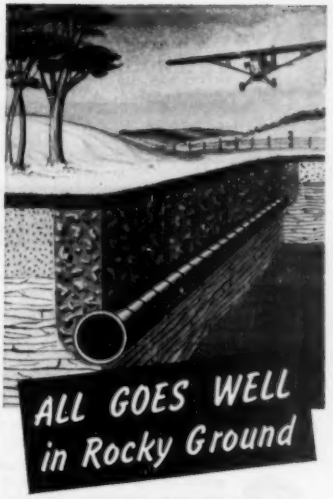
Oral arguments will get under way on that date on a motion by an FPC staff counsel to dismiss the company's application. The motion was made during a hearing on the application commencing April 15 and adjourned by the commission April 17 until further order.

The staff counsel then maintained that the company had failed to submit the necessary exhibits showing that it had a market for the gas it would transport through the proposed line. He asked that the application be dismissed without prejudice — meaning that the company could refile at a later date.

Texas-Ohio filed an answer in opposition to the staff motion on April 28. Counsel for the coal and railroad intervenors filed a memorandum supporting the motion.

FPC issued an order May 14 denying the company's petition which asked reconsideration of the order adjourning the hearing and requested that a date be fixed for the hearing to be reconvened.

The commission also issued an order permitting Reserve Natural Gas Corp.,



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Cincinnati, and the Ohio Public Utilities Commission to intervene in the proceeding.

Texas-Ohio was organized in May 1951 to build the big gas line, which would originate in Hidalgo County, Texas, and extend through Arkansas, Mississippi, Tennessee, and Kentucky, and terminate near Spencer, W. Va.

Capacity initially would be about 330,000,000 cu. ft. daily, later being increased to 505,000,000 cu. ft., and ultimately reaching 650,000,000 cu. ft.

Arguments Set for June 16 On Expansion by Texas Gas

WASHINGTON.—The Federal Power Commission has scheduled oral arguments for June 16 here on the consolidated application involving proposed construction by Texas Gas Transmission Corp., Owensboro, Ky., of 407 miles of 26-in. loop line and 26,860-hp. in compressor capacity.

The commission at the same time ordered the intermediate-decision procedure omitted on request of Texas Gas and two subsidiaries, Texas Northern Gas Corp. and Louisiana Natural Gas Corp., both of Lake Charles, La.

Filing of main briefs will take place May 20, and reply briefs will be filed by June 4.

The other companies whose applications are involved in the proceeding are Ohio River Pipeline Corp., Indianapolis; Louisville Gas & Electric Co., Louisville; and United Gas Pipe Line Co., Shreveport.

Radio Permits Granted

WASHINGTON.—Construction permits for 1 base station, 1 fixed-relay unit, and 80 mobile units in the pipeline radio service have been granted by the Federal Communications Commission as follows:

Natural Gas Pipeline Co. of America, 65 mobile units on 33.30 mc.

Hope Natural Gas Co., one base station on 48.70 mc. at Cresap, W. Va., and 1 fixed-relay unit on 457.25 mc. near Kent and McKeefry, W. Va.

Southern Natural Gas Co., 15 mobile units on 49.06 mc. in Alabama, Georgia, Mississippi, and Louisiana.

Maintenance Contract Let

SAN ANTONIO. — Contract has been awarded to N. A. Saigh Co., Inc., to recondition an Arkansas and Mississippi section of Texas Gas Transmission Co.'s line to the East.

Project will include taking up, reconditioning, and relaying a 20-mile section of 18-in. pipe, which includes crossings of the Boeuf River and two bayous in eastern Arkansas.

Morganfield Natural Plans 31-Mile Kentucky Lateral

MORGANFIELD, Ky. — Morganfield Natural Gas Co., is planning construction of a 31-mile, 6 and 4-in. lateral natural-gas line from this city to a connection with a line proposed by Texas Gas Transmission Corp., Owensboro, Ky.

Righ-of-way of the line would pass through Sturgis, Providence, Clay, Diamond, Wheatcroft, and Sullivan, Ky. Estimated cost of the lateral is $580,000. Morganfield plans to sell gas at wholesale in Providence and Sturgis and at retail in the other communities. Distribution facilities in the communities served at retail are estimated to bring total cost of the construction to about $1,075,000.

An application for approval of the project was filed recently with the Federal Power Commission.

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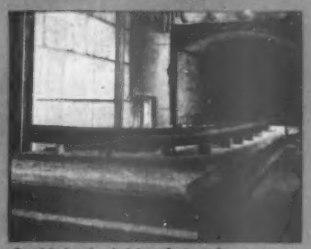
MAIN STEAM PIPING INSTALLED AT SALEM HARBOR STATION OF NEW ENGLAND POWER COMPANY

Manufacture of this main steam piping began at Pennsylvania Forge Corporation as 20-ton alloy-steel ingots (2¼% chrome, 1% moly steel). Four days' forging changed the ingots into solid bars 30 ft. long, with outside diameter of 15½ in. Boring, turning, sizing and finishing followed.

Bending furnace raises pipe temperature to 2000°F in 3 hours, 40 minutes. Thermocouples and pyrometer measure pipe temperature.

Skilled team completes bend in six minutes. Inside surface temperature dropped about 100°F.



Bend being loaded into furnace for stress relieving. Heat maintained at 1425°F for 4½ hours, then gradually reduced.

Ultrasonic inspection of wall after cleaning of pipe shows maximum thinning in bend of 1/16 inch.

FABRICATION of the main steam line for the Salem Harbor Station of the New England Power Company, vital link in more than 52 miles of piping fabricated by Grinnell, is an example of the *many* skills required of Grinnell piping specialists. Grinnell chemists, metallurgists, physicists, radiologists and supersonic electronic scientists . . . *all* played a part in the bending, welding and testing operations.

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REFINING

Rash of Oil Fires Plague Refineries on Gulf Coast

HOUSTON.—A rash of oil fires broke out along the Gulf Coast during the past 2 weeks.

First installation hit was Eastern States Petroleum Co.'s refinery on the Houston Ship Channel. A tank containing rundown stock exploded, and the fire spread to several other tanks in the immediate area. The blaze was contained within the limits of Eastern States' installation. Damage was estimated at $100,000.

At the Gretna docks of Gulf Refining Co. near New Orleans, a gasoline barge exploded and caused damage estimated at $650,000. The barge was engaged in discharging gasoline when the mishap occurred.

Most recently, Corpus Christi experienced its worst fire in history when an 80,000-bbl. tank at General American Tank Storage Co.'s terminal containing 50,000 bbl. of kerosine blew up, and fire engulfed the adjacent Southwestern Oil Refining Co. plant. Damage is expected to run into the millions, but no figure, currently, has been set for the total amount of equipment, tanks, and products destroyed in the blaze.

Conoco's Refinery Expansion At Lake Charles Progressing

HOUSTON.—Enlargement and modernization of Continental Oil Co.'s Lake Charles, La., refinery, which will expand crude capacity ot the 11,000-bbl. plant to 40,000 bbl. daily, is progressing on schedule and should be completed in January 1953, L. F. McCollum, president, told stockholders last week.

On completion of the expansion, sales of products refined at the plant will be increased under an existing long-term contract by 10,000 to 12,000 bbl. per day. The additional sales volume is equivalent to between 8 and 10 per cent of Conoco's total refined products sales during the first quarter of this year. Total sales during the first quarter came to 124,111 bbl. daily as compared with 124,088 bbl. daily during the first quarter of 1951.

Conoco's refinery runs averaged 105,810 bbl. daily during the quarter —an increase of 6.4 per cent over the fourth quarter of 1951. However runs were down 7.8 per cent from the first quarter of 1951 when the company's refinery operations reached an all-time high.

Reason for the decrease was that during the first quarter of 1951, Continental's largest refinery at Ponca City, Okla., was running at a rate of about 59,000 bbl. daily, or about 112 per cent of rated capacity, whereas runs during the first quarter of this year declined to about 47,000 bbl. daily or about 90 per cent of capacity.

The drop was necessitated by the overaccumulation of refined products inventories which prevailed throughout the industry in the Mid-Continent area, McCollum said.

Shell Pulls Out of Joint Houston Petrochem Venture

HOUSTON.—Shell Chemical Corp. has dropped its plans to construct a jointly-owned vinyl chloride plant with Diamond Alkali Co. and also has curtailed expansion of its ethyl chloride plant.

Diamond, meanwhile, announced that it was continuing with the expansion of facilities costing in excess of $10,000,000. According to C. E. Lyon, plant manager, the new units will make vinyl chloride, polyvinyl chloride, and perchloroethylene.

Shell's action in pulling out of the joint venture and in halting ethyl chloride-expansion plans was apparently due to market conditions, B. M. Downey, manager of Shell's Houston plant said that what may seem an attractive situation can change almost overnight in the fast-stepping petrochemical industry.

He intimated that they were planning a move in another direction. Shell recently completed a 30 per cent expansion of its ethyl chloride facilities and also purchased Julius Hyman & Co., a Denver insecticide firm.

Hercules Petrochem Plant To Be Built in New Jersey

WILMINGTON, Del. — Hercules Powder Co. has selected a 275-acre tract of land near Gibbstown, N. J., as site for its new $8,000,000 petrochemical plant.

The plant will be located on the Delaware River, slightly northwest of Gibbstown, between Socony-Vacuum Oil Co.'s plant and the Repauno plant of E. I. du Pont de Nemours & Co., Inc.

Construction will start late this year

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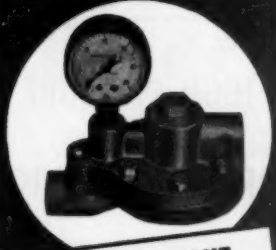

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or early in 1953, depending upon the availability of materials. Products will be phenol, paracresol, acetone, and cymene alcohols.

Hercules officials said the Delaware River site was chosen because propylene and benzene, which are required in the phenol-manufacturing process, are available from petroleum refineries in the neighborhood. The terpenes for the paracresol process will come from company plants in Georgia and Mississippi.

Phenols will be produced by means of a new process developed by Hercules at its experiment station near Wilmington and at its Brunwick, Ga., plant. The process involves production of organic hydroperoxides as the basic intermediate step in converting hydrocarbons to phenols and cresols.

The new method requires neither sulfur nor chlorine, both in short supply and ordinarily consumed in other processes currently in use.

Dow Completes First Part Of Expansion at Freeport

FREEPORT, Tex.—Dow Chemical Co. has announced completion of a $30,000,000 expansion project at its plants here first part of a $175,000,000 program.

The completed project includes new facilities for the production of ethylene, ethylene glycol, styrene, vinyl-vinylidene chlorides, chlorine, and power.

According to Dr. A. P. Beutel, vice president and Texas-division general manager, a $50,000,000 program has been under way for some time. This latter phase will provide for increased production of ethylene dichloride, perchloroethylene, carbon tetrachloride, chloroform, vinylidene chlorides, and inorganic products.

Dow recently announced plans for a national expansion program involving an outlay of $325,000,000.

Esso Cat Cracker at Baton Rouge Completes Record Run

BATON ROUGE.—The No. 3 catalytic cracking unit at Esso Standard Oil Co.'s refinery here recently completed a 750-day operational run, setting a record for cat cracking units in all Esso plants.

During the run, feed to the unit averaged 46,300 bbl. per day. This represents a considerable expansion in capacity since the unit first went on stream in 1943 at a rated 15,000-bbl. figure.

During the turnaround period, plans call for the further expansion of the unit's capacity.

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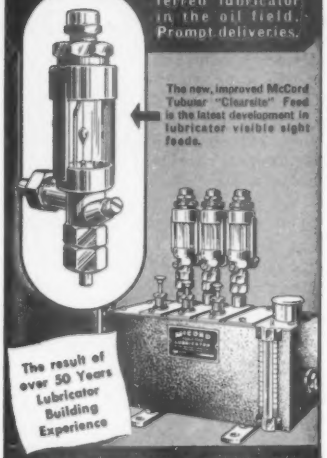
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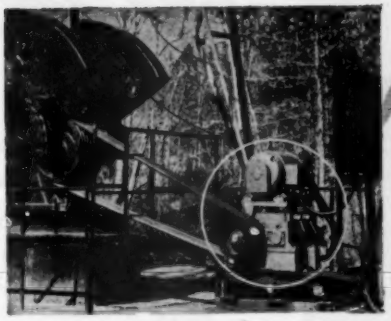

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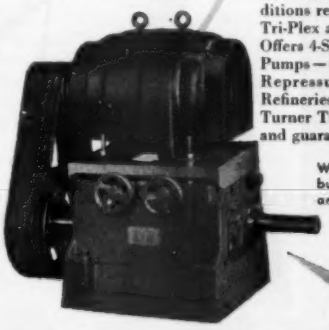

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Among the Drilling Contractors

Four New Contractors For Illinois District

Latest additions to the growing list of drilling contractors operating in the Illinois basin area include Newman Drilling Co. and Valley Drilling Co., both headquartering at Evansville, Ind., Domac Drilling Co., New Harmony, Ind.; and C. B. Mansfield Drilling Co., Terre Haute, Ind.

Newman Drilling Co., operating two rotary rigs, was organized by O. S. Newman, formerly associated with Gilliam Drilling Co., also of Evansville. Monroe Dyer, formerly production superintendent in the district for Sohio Petroleum Co., heads the newly formed Valley Drilling Co., starting with one new rotary rig.

Domac Drilling Co. is owned by F. H. Carlos of New Harmony and W. L. McNeil, Salem, Ill., and has a new rotary rig. C. M. Mansfield Drilling Co. is headed by C. M. Mansfield with J. S. Segler of Evansville as field superintendent and manager. It also has a new rotary rig.

Commonwealth Drilling Co., Calgary, has been awarded drilling contract for Anglo-Home C & E 14-28 Camrose, in LSD 14, 28-48-20w4, a new extension test in the Camrose Viking sand field, Alberta Province, Canada.

Long Brothers, Mirando City, Tex., have a new operation under way for Sid Katz and associates of San Antonio in the area 4 miles northeast of Oilton, in Webb County, southwestern Texas, and have contracted for another to be started as soon as their rig can be released from the first. Drilling is Katz and associates 1 Paul de la Garza, contracted to 2,800 ft. The additional contract is for a 3,200-ft. test.

New Drilling Company

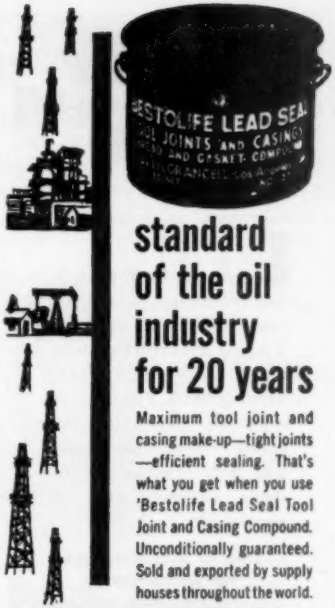
Schafer Drilling Co. is a newly organized drilling firm with offices at Oklahoma City. Harry J. Schafer, Sr., is president; T. W. Ward, vice president; and Harry J. Schafer, Jr., secretary-treasurer.

Lodestar Drilling Co., Calgary, has the contract for a 10,000-ft. wildcat venture in the southeast sector of Saskatchewan Province, Canada. The test, Socony-Vacuum Exploration Co., Central Leduc Oils, Ltd., and Del Rio Producers, Ltd., 1 Ratcliffe, is located in LSD 5, 30-1-15w2, 4½ miles north of the United States border and 60 miles northwest of Amerada Petroleum Corp. 1 Iverson, discovery well of the Williston basin, in North Dakota.

Sanders & Fye, Inc., Olney, Ill., is moving one of its rotary rigs from the Illinois basin area to Pennsylvania, where it will drill under contract for Keta Oil & Gas Co. of Bradford, Pa.

Newton Barrett Drilling Co., Shawnee, Okla., has a rig working in the Lamott area, in southeastern Grant County, Oklahoma, where it is contracting for Midwest Oil Co. and Ash-

PERSONNEL CHANGES of Warren-Bradshaw Exploration Co. (formerly Warren-Bradshaw Drilling Co.), Tulsa, include appointment of Oadus White (left), formerly division drilling superintendent at Oklahoma City, as drilling superintendent; Klag H. Reed (center), formerly production foreman of the West Texas-New Mexico district, Odessa, as production superintendent; and LeRoy F. Stewart (right), formerly geologist at Tulsa, as head of the company's newly formed exploration department. (For story, see page 181, May 19, 1952, issue.)



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TORQUE WRENCHES
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in inch ounces . . . inch pounds . . . foot pounds (All Sizes from 0-6000 ft. lbs.)

STURTEVANT TORQUE MANUAL

Every manufacturer, design and production man should have this valuable data. Sent upon request.

STURTEVANT CO.

land Oil & Refining Co. at 1 Staggers, NW SW NW 4-25n-3w. Location is north of the Southeast Lamott pool.

Blue Rock Drilling Co., Bradford, Pa., has the contract for the California Co.'s second exploratory test in Pennsylvania. The new operation, to be drilled with cable tools, is 1 Byron Schneider, located in the north-central part of Lycoming County. It is east and slightly north of the Leidy gas field. The operator's first test, 1 A. E. Bennett, located in the Munsey area, Sullivan County, was abandoned late last year at 13,343 ft.

Power Rig Drilling Co. will handle contract for The California Co. 1 Long Bell Petroleum Co., Inc., proposed 10,500-ft. Wilcox wildcat in central Rapides Parish, Louisiana. Location of the new venture is 3 miles southwest of Melder in 9-1n-3w.

Penrod Drilling Co., Shreveport, is contractor for a 6,000-ft. Wilcox test in Concordia Parish, East Central Louisiana, which H. L. Hunt will drill as confirmation to Barnett Serio 1 A. M. Burrell, recent oil discovery. The new operation is 1 C. F. Farrar.

Falcon Seaboard Drilling Co., Tulsa, has the contract for Feagin Co. 1-A Cundiff, proposed 5,200-ft. test in the NE NW SW 9-17n-1e, Logan County, Oklahoma. Location is east of Coyle in the four-pool area known as the "Golden Groove."

Regent Drilling Co., Edmonton, has been awarded contract to drill Leader Petroleums, Ltd.-Target Petroleums, Ltd. 1 Anaconda on LSD 11, 13-49-26w4, a wildcat in the McLeod sector, southeast of Leduc, in Alberta Province, Canada.

ACTIVE ROTARY RIGS*

(United States and Western Canada)

Area—	Week ended 5-19-52	Change week ended 5-12-52	Change week ended 5-21-51
Gulf Coast	641	+25	+ 84
N. & W. Tex.-N. M.	1,015	−37	+137
Ark.-N. La.-E. Tex.	142	0	− 2
Oklahoma	350	+ 4	+ 58
Kans.-S. Neb.	163	−21	− 6
Illinois-Eastern	146	+ 2	− 11
Rocky Mountains	219	+15	+ 82
Pacific Coast	162	+ 3	+ 5
Total U. S.	2,838	− 9	+347
Western Canada	180	− 1	+ 53
Total	3,018	−10	+400

*Courtesy Hughes Tool Co. Trends in drilling activity in the United States and the Pacific Coast and Illinois-Eastern areas are shown on pages 262 and 263.

PROMPT SHIPMENT FROM DALLAS STOCK

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SHEAVES • FLAT BELT PULLEYS • HANGERS PILLOW BLOCKS • COUPLINGS • BEARINGS COLLARS • "SURE-GRIP" SHEAVES AND PULLEYS • "SURE-GRIP" STANDARD, SUPER AND STEEL CABLE V-BELTS • COMPLETE DRIVES

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Standco Brake Lining Co.
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gives MAXIMUM STRENGTH with MINIMUM WEIGHT

RUGGED LOW COST NON-SKID VERSATILE

NOT welded. Vertical members joined by integral saddles to form a positive NON-SKID surface under *all* conditions. In one single unit, GRIP-STRUT Safety Grating combines great strength with light weight, its side channel members greatly reduce cost of construction and simplify installation. Easy to maintain and clean. Replaces old or obsolete types of grating. Grip-Strut has a lower cost factor than any other type of grating. Available in steel or aluminum.

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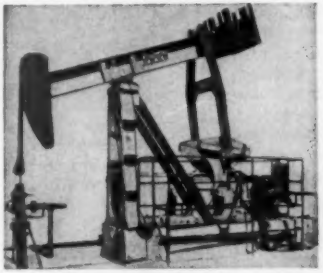
Scientists claim that green is the most soothing color for the nerves—especially the long green!

If high production costs are giving you ulcers, turning your temples gray and cutting your profits—it will pay you to find out how soothing a JENSEN Pumping Unit can be!



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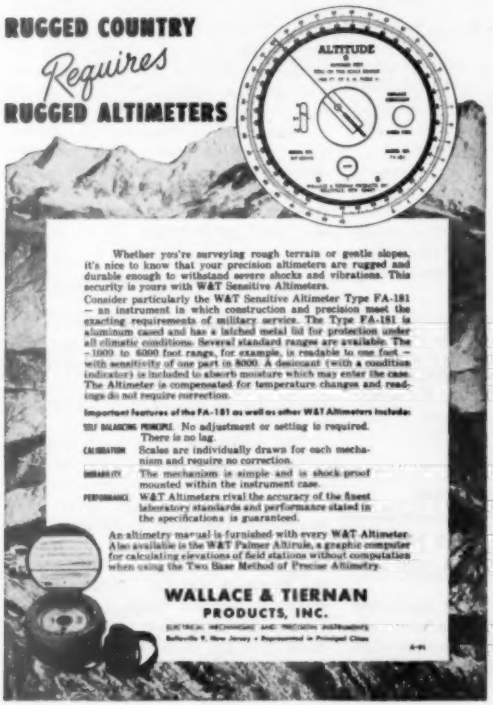

Whether you're surveying rough terrain or gentle slopes, it's nice to know that your precision altimeters are rugged and durable enough to withstand severe shocks and vibrations. This security is yours with W&T Sensitive Altimeters.

Consider particularly the W&T Sensitive Altimeter Type FA-181 — an instrument in which construction and precision meet the exacting requirements of military service. The Type FA-181 is aluminum cased and has a latched metal lid for protection under all climatic conditions. Several standard ranges are available. The –1000 to 6000 foot range, for example, is readable to one foot — with sensitivity of one part in 8000. A desiccant (with a condition indicator) is included to absorb moisture which may enter the case. The Altimeter is compensated for temperature changes and readings do not require correction.

Important features of the FA-181 as well as other W&T Altimeters include:

SELF BALANCING PRINCIPLE. No adjustment or setting is required. There is no lag.

CALIBRATION Scales are individually drawn for each mechanism and require no correction.

DURABILITY The mechanism is simple and is shock proof mounted within the instrument case.

PERFORMANCE W&T Altimeters rival the accuracy of the finest laboratory standards and performance stated in the specifications is guaranteed.

An altimetry manual is furnished with every W&T Altimeter. Also available is the W&T Palmer Altitrule, a graphic computer for calculating elevations of field stations without computation when using the Two Base Method of Precise Altimetry.

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Instant Full-Open Relief of Excessive Pressures

KINZBACH MODEL 412 RELIEF VALVE

A dead weight load determines the opening pressure of the Kinzbach Model 412 Hydraulic Relief Valve . . . and when that pressure is reached, the valve opens instantly, providing full-open relief when it's needed most.

It's simple and safe—only two moving assemblies. Test rod permits functional testing at any time. Available for opening pressures from 50 to 1000 p.s.i.

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KINZBACH TOOL CO INC

NATURAL GAS

Long-Term Export Contracts Worry Texas Commissioner

AUSTIN.—Long-term dedication of Texas natural-gas reserves to interstate pipe lines, and its effects on industry in the state, is worrying Texas Railroad Commissioner William J. Murray, Jr.

Murray's views were revealed to District Judge Jack Roberts of the 112th District Court here during the opening phase of the trial of cases testing the state's gas-gathering tax, which 51 companies claim is an invalid levy on commerce.

Murray said pipe lines have furnished a market for Texas gas, much of which was formerly wasted in the oil fields. He thinks free operation of supply and demand should be permitted to determine the gas industry's future, but at the same time is bothered by the fact that natural gas is the only industrial fuel in Texas.

If reserves become so committed to export that gas becomes unavailable for industry in Texas, the state's development will suffer, Murray said.

Helen Gohlke Operators to Join in Gathering Project

CORPUS CHRISTI.—Construction will begin soon on a casing-head-gas compressor plant and gathering system to serve oil wells in Helen Gohlke field of DeWitt and Victoria counties Texas.

The 2,640 hp. compressor plant will handle up to 12,000,000 cu. ft. of casing-head gas daily and will be located on a 25-acre tract about 19 miles north of Victoria in DeWitt County.

The plant is a multiple-ownership project which will be constructed and operated by Shell Oil Co. Other participants are Humble Oil & Refining Co., Kirby Petroleum Co., and Monterey Oil Co. of Texas. It is expected that all other oil producers in the field will eventually participate.

Sales Gain in March

NEW YORK.—Sales of natural gas during March gained 13.5 per cent over those in March 1951 to total 4,967 million therms, according to the monthly report of the American Gas Association.

March sales also were 36 million therms over the 4,931 million therms sold in February this year. The A.G.A. index of sales in March was 438.2 per cent of the 1935-39 average.

Domestic Use May Double In 25 Years, Foster Says

STATE COLLEGE, Pa. — Battelle Memorial Institute's supervisor of fuels, Dr. John F. Foster, said recently that use of natural gas in the home may more than double in the next quarter century.

Speaking before the closing session of the American Chemical Society's Division of Gas and Fuel Chemistry at its spring meeting, Foster estimated that about 20 per cent of total gas production now goes to the domestic consumer, whose needs, he said, natural gas is particularly well adapted to meet.

This rise in domestic use of gas, however, may be offset somewhat by a slower rate of increase in other uses since it will be supplied to the premium household market in preference to others.

Allied Chemical Plans New Nitrogen Plant in Nebraska

LA PLATTE, Neb.—Allied Chemical & Dye Corp. is planning construction here of a $25,000,000 plant using natural gas as a raw material to produce nitrogen-fertilizer materials.

The proposed construction, about 15 miles south of Omaha, depends on action by the Federal Power Commission in either approving or rejecting an application filed by Northern Natural Gas Co., Omaha, to install facilities to bring gas to the plant.

Allied has secured options on plant sites near the junction of the Missouri and Platte rivers with frontage on both.

The company said construction would start this summer and be completed within 18 months to 2 years, if FPC approves soon.

Natural Gasoline

Dedication Slated for New Wilshire-Lone Star Plant

CRANE, Tex. — Formal dedication of the new Wilshire Oil Co., Inc.,-Lone Star Gasoline Co. natural-gasoline plant 12 miles east of Crane, Tex., in the Wilshire-Ellenburger field of Upton County has been tentatively set for June 27.

The plant is about 90 per cent completed as to steel tonnage and about 80 per cent complete in regard to operations. Completion of the gas-gathering system is expected about June 1. Construction has been in progress now about 3½ months.

Initially, the plant will process about 9,000,000 cu. ft. natural gas per day from 28 producing oil wells, and output will be about 40,000 to 50,000 gal. of liquid products daily.

Phillips Storage Approved

AUSTIN. — The Texas Railroad Commission has approved an L.P.G. underground-storage project in Ector County, Texas, proposed by Phillips Petroleum Co.

Phillips' storage plan calls for washing out a 200,000-bbl. cavity in a salt formation found from 1,600 to 2,800 ft. in the vicinity of the company's Goldsmith natural-gasoline plant.

L.P.G.A., N.B.P.A. Merge

CHICAGO.—The Liquefied Petroleum Gas Association has accepted a proposal that the National Butane-Propane Association be consolidated with L.P.G.A., according to Charles Grau, president of N.B.P.A.

The consolidation is effective immediately, and all N.B.P.A. members will become members of L.P.G.A. if they so desire, Grau said.

Grau, who is president of Onedia Gas Co., Rhinelander, Wis., said the action was taken to implement a larger and stronger trade association to work toward better service to the liquefied petroleum gas industry.

Santa Fe Extends Oil Spur

AMARILLO.—Santa Fe Railway is building team-track facilities and has acquired more land at the end of its Benedum Spur in West Texas in order to improve its service to oil companies in the Spraberry area.

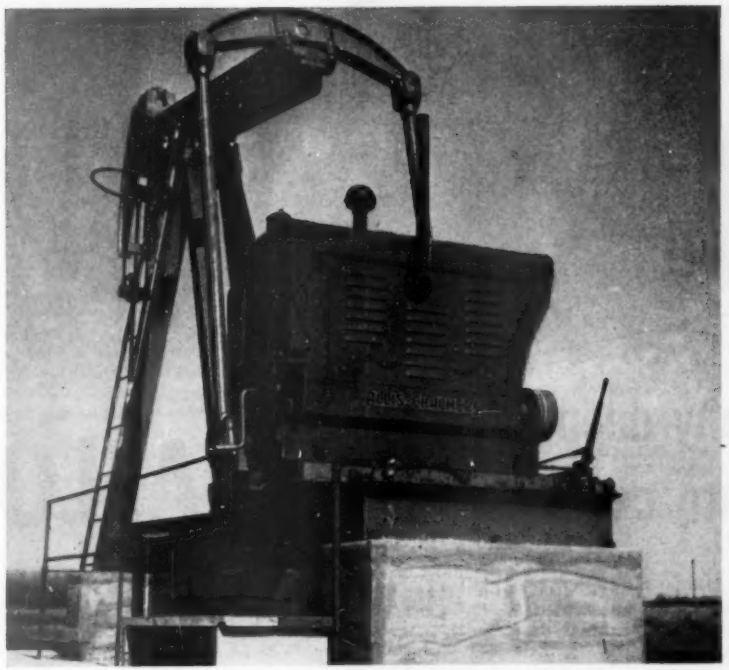
The additional team track will be 1,000 ft. long. About 23 acres of land adjacent to tracks and suitable for unloading facilities, storage space, and warehouses has been acquired by the railway.

Santa Fe's spur here was built to serve the Plymouth Oil Co., Phillips Petroleum Co., and the Texas Gas Products Corp. natural-gasoline plants. It runs north from the main line between Texon and Rankin, 10 miles to Benedum oil field.

Here's Why!

ALLIS-CHALMERS ENGINES

save you $$ on pumping wells



There are no *sledge hammer* blows.

Allis-Chalmers Engines deliver a *smooth flow* of power, at *moderate* speeds protecting your pumping unit and rods from shock and fatigue.

Mass Production keeps first cost and repair parts prices low. Repair parts and service available in all oil producing areas through the vast facilities of Allis-Chalmers branches and dealers and the Fred E. Cooper, Inc. branches.

COMPARE

1. Allis-Chalmers Quality
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With those of any other engine.

FRED E. Cooper, Inc.

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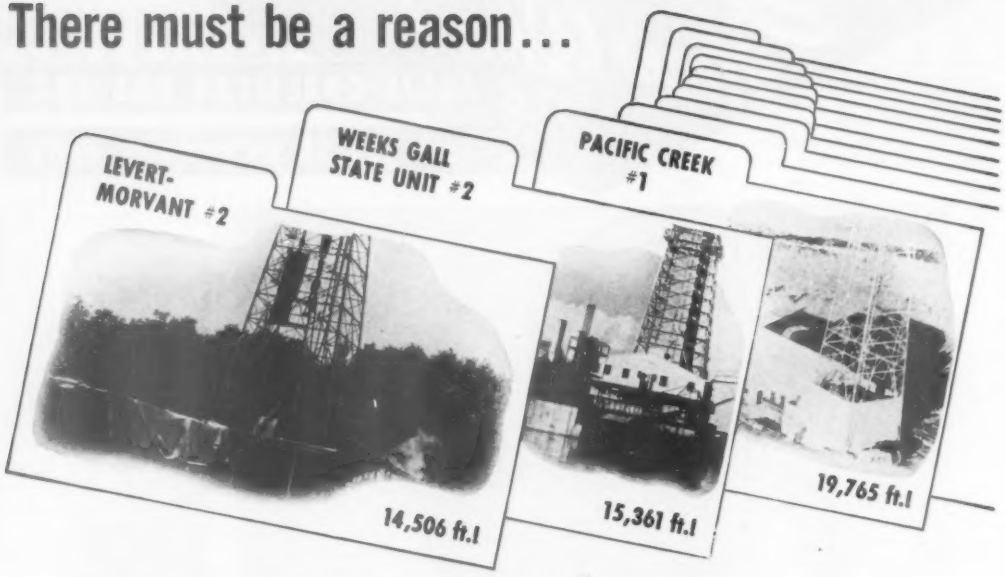
There must be a reason...



why so many deep wells are cemented with UNAFLO*

THE REASON is Unaflo's retarded set that gives more time to get the cement in place down a long hot string. And drillers know they can rely on Unaflo's dependable performance.

Unaflo's *retarded* set keeps slurries fluid and pumpable during the entire period of retardation despite heat and pressure. Unaflo's setting time is *delayed* not just slowed.

That's vital in the deep ones. And it's a comfortable safety factor in emergencies. Easier pumpability permits you to do a better job of placing the cement behind the casing.

So on your next job, take a tip from the deep pay producers—let Unaflo protect your investment three ways:

1. EASY PUMPING—Unaflo's high *initial* fluidity makes pumping easier right from the start.

2. SUSTAINED FLUIDITY — Unaflo stays fluid and pumpable throughout the retardation period. There's ample time, even in emergencies, to get the cement in place.

3. HARDENS NORMALLY—Unaflo, after its retarded period, makes a strong, tight seal – resistant to sulfate waters.

SEND FOR FREE BULLETIN—gives data tables of Unaflo's well-bottom performance and that of our other cements. For your copy write: Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

*"UNAFLO" is the registered trade mark of the retarded oil-well cement manufactured by Universal Atlas Cement Company

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Universal Atlas Cement Company

OIL-FIELD CEMENTS

Unaflo *Retarded* **Oil-Well Cement**
Resistant to Sulfate Waters
Atlas Portland Cement—Type I
Atlas Portland Cement—Type II
Resistant to Sulfate Waters
Atlas High-Early Cement—Type III

OG-U-126

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—NBC Network*

Texas Panhandle Prospects Improve

ONE completed discovery and three indicated discoveries in four counties have resulted in a more appreciative view of the potentialities of the Texas Panhandle areas outside the established trends of oil and gas production. Three of the possible discoveries are in the northern end of the Anadarko basin and the fourth is on the eastern edge of the Dalhart basin.

At A on map is Kerr-McGee Industries, Inc., 1 Berneta, which was carried to granite. This Hartley County wildcat is now testing Upper Pennsylvanian-granite wash at around 5,700 ft. following a substantial recovery of oil with some salt water on a drill-stem test.

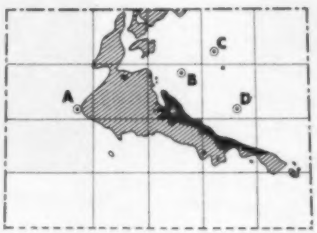
In Hutchinson County, The Texas Co. 1 Holt, B on map, is scheduled for completion as a gas discovery in the Douglas at 4,500 ft. and another Pennsylvanian sand at about 6,000 ft. Drill-stem tests indicated a combined potential of more than 10,000 M.c.f. of gas daily.

J. M. Huber Corp. 1 Pazourek, C on map, Ochiltree County, has been completed in the Pennsylvanian-Atoka at 8,020-60 ft. Unofficial gage was 4,000,000 cu. ft. of gas daily with 10 bbl. of distillate per million cubic feet.

What now appears the most interesting of all the indicated discoveries is Gulf Oil Corp. 2 Haggard, D on map, Roberts County, which flowed 78 bbl. of 51°-gravity oil in 6 hours from the Permian - Brown (Wolfcamp) dolomite at 4,000 ft. Gas flowed at an estimated rate of more than 8,000,000 cu. ft. daily.

Essentially all of the billion barrels of oil in the Panhandle area is in Permian dolomites below the red beds and in the Upper Pennsylvanian - granite wash on the northern flank of the 110-mile-long buried granite ridge which underlies Panhandle oil and gas field. Most of the reserve was developed in the early twenties, but in 1947, following the discovery of Elk City field in Beckham County, just across the Oklahoma line, interest turned to the north of the producing fields.

It was not until 1949, however, that



discoveries were made in areas apart from the tremendous interconnected reservoirs of Permo-Pennsylvanian age. During 1949 Sinclair Oil & Gas Co. found oil in fractured Mississippian-Meramec limestone on a seismic and gravity indicated high to open Lips pool (just southeast of C on sketch map). Initial production was high, but water came in and, after producing 15,000 bbl. of oil, the well was drilled to the Arbuckle without finding significant porosity. The well was plugged back for completion as a gas well in a sandy limestone of the Douglas group. The second Lips well failed to find oil in the Meramec but did discover gas in the Lower Pennsylvanian-Atoka.

Other 1949 discoveries which proved the presence of oil and gas in older Pennsylvanian rocks were drilled by Phillips Petroleum Co. on a structural high (Kathryn-Willclo, northwest of B on map) on the eastern edge of Panhandle field. One well found commercial gas in the Des Moines series and the other found oil in the basal Des Moines-Atoka.

Last year saw the completion of three discovery wells. The Texas Co. had two small Pennsylvanian - upper Morrow discoveries in southernmost Ochiltree County straddling Lips field and Phillips completed a gas well on the Kathryn-Willclo structure to add younger Pennsylvanian-Missouri rocks to those productive at this 1949-discovered fields.

Though the search for oil off the beaten path in the Texas Panhandle has not proven very exciting to date the possibility that the oil and gas of the big Panhandle field migrated from pre-Pennsylvanian rocks continues to supply the incentive needed for exploratory drilling in the sparsely tested hard-to-work area.

Philip C. Ingalls.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

MONTANA . . . Ajax Oil Co. 1 McGowan, West Poplar wildcat, reported a flow of 15-20 bbl. of oil per hour from 6,164-89 ft., apparently from the Charles which was topped at 5,778 ft. Testing is continuing on the apparent new Williston basin discovery.

MICHIGAN . . . Sun Oil Co. is completing 1 Lutzi et al., Clare County Richfield discovery, and Brazos Oil & Gas Co. has completed a Richfield Rose City extension wildcat in Ogemaw County, for the two most important discoveries in several years.

COLORADO . . . The first indicated commercial Cloverly production in the Denver-Julesburg basin was reported at Sinclair Oil & Gas Co. 2 Sindt, West Padroni extension, after recovery of 905 ft. of 25°-gravity black oil on test in the Lakota "M" sand (Cloverly).

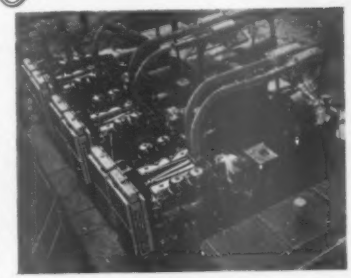
SASKATCHEWAN . . . Another heavy crude-oil discovery has been made in the province by Husky Oil & Refining, Ltd., and Phillips Petroleum Co. in the Hoosier area, becoming the third oil strike for 1952 in Saskatchewan.

GM Diesel
Case History No. 5211-12

USER: Al Buchanan Drilling Company, San Antonio, Texas. Rig No. 9.

INSTALLATION: Three GM Diesel "Twin 6" torque-converter units, powering a Clark-Ideco PR-1000 rig. Replaced other GM Diesels that had given four years' continuous trouble-free service. Bought new GM Diesels to get dual-fuel torque-converter units.

PERFORMANCE: Since July, 1950, engines have drilled more than 85,000 feet of hole (one well 12,000 feet deep). Maintenance costs negligible and owners report, "we are happy to recommend GM Diesels."



This Diesel Gives Drillers More Power

GM
GENERAL MOTORS
DIESEL POWER

California

Evaluation Tests Staked At Recent Eocene Strike

LOS ANGELES.—Richfield Oil Corp.'s recent Eocene discovery at Wheeler Ridge on the southern end of San Joaquin Valley has resulted in two evaluation tests being staked. Richfield has started 76 Kern County Land-D as a southwest offset to the 10,000-ft. field opener. In NW SE 28-11n-20w, Standard Oil Co. of California has located 356 K.C.L.-2 as a ¾-mile southeast extension attempt.

The discovery well, the first to establish Eocene production in the southern part of the valley, originally was completed flowing about 1,200 bbl. of oil from 156 ft. of sand above 9,756 ft. A gas leak in the 7-in. casing necessitated remedial work so that it was recompleted by setting a 5½-in. protective string inside the 7-in.

Activity in the South Mountain area near Santa Paula continued to pick up, increasing the number of rigs engaged in that development to 10. About ½ mile southwest of the field, Ohio Oil Co. started two rigs at work from multiple-well locations near its recent extensioner in SW 24-3n-21w. Shell Oil Co. has five rigs drilling from island locations in the field and The Texas Co. recently resumed activity at its properties on the north flank of South Mountain.

At the upper end of Santa Clara Valley, development of Honor Rancho-Castaic Hills field reached the point where 11 rigs were drilling. In the surrounding area six wildcats or extension attempts were under way.

On the southeast end of Honor Rancho, The Texas Co. 2 Honor Rancho-2 was drilling and coring below 7,711 ft. Located in NE SE 6-4n-16w, and about 2,000 ft. east of production, the stepout apparently was searching for the Sterling sand which is productive in the Castaic Hills area but as yet unproductive at Honor Rancho. The company did considerable coring and testing in the two upper pays but whether or not they tested wet was not revealed.

About 2 miles northwest and ¼ mile south of production, Standard of California 85 Golden also was searching for the Sterling sand after reaching 6,400 ft. Richfield was drilling below 4,800 ft. at 14 Ament, between this attempted extension and the field proper, and on the northwest edge of the field started 73 Golden as a one-location west stepout.

In Cuyama Valley, a new wildcat started by Richfield southeast of Central Cuyama increased the number of exploratory wells under way there to six. The new wildcat is 33-26 Perkins, about ½ mile southeast of the deep one-well pool discovered by Seaboard Oil Co. a year ago. Superior Oil Co. 1 Cuyama Government, in SE NE 21-9n-26w, was below 850 ft.; and Shell Oil Co. 1 Mackie in NW NW 19-11n-27w, was drilling below 7,700 ft. In the Morales Canyon area to the northwest, Basin Oil Co. 48 Heller was below 4,640 ft.

CALIFORNIA WILDCAT FAILURES

Kern County, Arvin area: The Texas Co. 1 Di Giorgio A, 10-31s-29e, dry, TD 5,661 ft., elev. 499 ft.

Dagney Gap area: M J M & M Oil Co. 1 Alferitz, 10-25s-18e, dry, Carneros 1,104 ft., Point of Rocks 1,251 ft., TD 2,512 ft., elev. 580 ft.

Gosford area: Hancock Oil Co. 43-14

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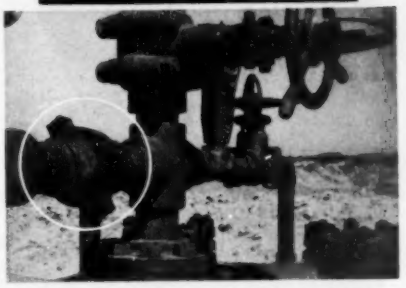
"Those Weco Unions sure stand up under the beating they get on the road here."

DRILLING ENGINEER
"Uniform precision manufacture of Weco Unions enables us to plan piping layouts within critical dimensions."

PRODUCTION SUPERINTENDENT
"Weco Fig. 602 Unions are perfect for manifolding, particularly in close quarters."

PURCHASING AGENT
"We like the way we can use those Weco Unions on job after job. That saves money in the long run."

DRILLER
"I can depend on Weco Unions for a perfect seal... and that means everything on blowout preventer closing lines."



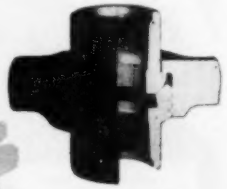
The Strong, Compact FIG. 602 is ideal for high pressures, rough service

The shorter, stronger sub ends of the WECO FIG. 602 UNION give it compactness plus the strength needed for today's deeper drilling. It is especially efficient for manifolding where clearances are limited and connections are close coupled.

The famous Weco steel-to-steel seat in the Fig. 602 is protected against abrasion and corrosion by a replaceable, resilient seal ring. It is available with sub ends threaded or bored for welding.

The Fig. 602 is another good example of why "It's Wise to Standardize with WECO." Start your standardization now, by specifying WECO Unions.

FIG. 602
6000 p.s.i. Test
Sizes: 1", 2", 3", 4"



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Manufacturers and Distributors of Oilfield, Refining, Marine and Industrial Equipment

WILLSON®
plastic protective equipment

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KCL, 14-30s-26e, dy, TD 8,496 ft., elev. 361 ft.

Tejon area: Richfield Oil Corp. 71-2 Tejon A, 2-10n-19w, dry, TD 4,184 ft., elev. 967 ft.

Tunis Creek area: Macrate Oil Co. 1 Reserve, 30-11n-18w, dry, Santa Margarita 1,040 ft., TD 2,404 ft., elev. 840 ft.

Tulare County, Porterville area: Pioneer Associates 3 Congress, 22-22s-27e, dry, TD 1,115 ft., deepened from 838 ft., elev. 528 ft.

Ventura County, Tapo area: Aeco Corporation 2 Tapo, 13-3n-18w, dry, TD 1,809 ft., elev. 2,480 ft.

South Louisiana

Distillate Well Flows On Test in Beauregard

NEW ORLEANS. — Magnolia Petroleum Co. made a 14-hour test on 1 Magnolia 4-C unit, Beauregard Parish after setting 2-in. tubing at 11,870 ft. The well flowed at a rate of 3½ bbl. distillate plus 275,000,000 cu. ft. of gas per day on a 10/64-in. choke. Tubing pressure registered 575 psi. gravity 54°, and gas-oil ratio 45,750-1. Total depth is 11,914 ft. Location is 32-3S-9w, 1½ miles north of Burt.

Woods Oil & Gas Co. were preparing to complete 1 Dr. B. R. Slaughter, 6-18s-27e, Plaquemines Parish through perforations 11,230-241 ft. On latest test, the well flowed 73 bbl. of oil on a 10/64-in. choke with tubing pressure 3,625 psi. and gravity 35.9°. Total depth is 11,337 ft.

Superior Oil Co. has reported a new gage on 1 Rockefeller, 4-16s-3w, Cameron Parish discovery. The new wildcat, located 7 miles southeast of White Lake is bottomed at 12,030 ft. with 7-in. casing cemented at that point. On latest drill-stem test at 10,948 ft., fluid reached the surface in 7 minutes, and on an 8-hour test through perforations from 11,242-250 ft., the well flowed at a rate of 146 bbl. of distillate plus 8,463,000 cu. ft. of gas per day on 5/8-in. by 22/64-in. chokes. Working pressure was 3,372 psi., gravity 50.5° and gas-oil ratio 62,178-1. Previous 24-hour test with drill-stem set at 11,400 ft. the well flowed 114.3 bbl. of condensate plus 7,681,000 cu. ft. of gas per day with working pressure of 3,320 lb., gravity 46.9° and gas-oil ratio 74,602-1. Operator is preparing new test at 11,220 ft. after fluid reached surface in 8 minutes with immediate string blow.

Richardson & Bass are coring at 14,363 ft. in the Shell-Luma Darbonne venture in Allen Parish and are expected to core to approximately 16,000 ft. before making a decision on the well. Wildcat is located in 19-5s-3w and has casing set to 11,853 ft.

Humble Oil & Refining Co. has brought in its second well in the recently discovered reservoir in Little Lake field, Jefferson Parish. On initial production the Louisiana Land & Exploration Co. F-2 flowed 385 bbl. of 36.3°-gravity oil daily through a 3/16-in. choke along with 230,000 cu. ft. of gas. Perforations were made at 10,216-228 ft. with 72 shots.

SOUTH LOUISIANA SUCCESSFUL WILDCATS

Acadia Parish: oil discovery—Pan American Production Co. 1 Archille Andrepont, 42-8s-1w, TD 10,746 ft., perf. 9,268-74 ft., IP 79 bbl. oil per day, 8/64-in. choke, 32.2° gravity.

Allen Parish: oil discovery—Shell Oil Co. 1 J. A. Bel, 5-6s-3w, TD 6,405 ft., perf.

5,891-93 ft., IP 40 bbl. oil per day, 27.4° gravity.

Terrebonne Parish: gas-condensate discovery —Union Producing Co. & Texas Gulf Producing Co. C-1 La Terre Co., Inc., in Dulac area, TD 14,690 ft., perf. 14,148-56 ft., IP 144 bbl. condensate per day, ¼-in. choke, 46.8° gravity.

SOUTH LOUISIANA WILDCAT FAILURES

Allen Parish: Magnolia Petroleum Co. 1-D Ragley Lumber Co., 29-5s-7w, dry, TD 18,660 ft.

Terrebonne Parish: Stanolind Oil & Gas Co. 1-A South Shore Oil & Development Co., 13-18s-19e, dry, TD 14,505 ft.

Louisiana-Ark.

Deeper Pay Zones Reported In Barksdale Air Base Area

SHREVEPORT.—Two new deeper pay zones have been discovered in Sligo field, Bossier Parish, the Travis Peak sand and "D" sand of the Cotton Valley.

Natural Gas & Oil Corp. and Murphy Corp. 2 U.S.A., C SE¼ 12-17n-17w, completed February 1, is the discovery well of the two new pays which have recently been announced. The well was bottomed at 8,370 ft., string of 5-in. casing cemented through the pay section. Gas flowed at the rate of 3,760 M.c.f. daily with an estimated 40 bbl. of condensate per million feet from perforations at 7,910-24 ft. in the "D" sand, which had 11 ft. of net effective sand indicated.

In the Travis Peak gas flowed at the rate of 3,850 M.c.f. per day from perforations 6,160-83 ft. and 6,204-19 ft. The Travis Peak will produce essentially dry gas.

The confirmation well is 17 U.S.A., C NW¼ 6-17n-11w. This well appears to have very good prospects. On a ½-hour drill-stem test of the Travis Peak from 6,283-6,376 ft. gas flow was recorded. A drill-stem test from 7,931-41 ft. in the Cotton Valley "D" sand indicated gas-condensate production as found in the discovery well. Bottom of hole is at 8,525 ft. and 7-in. casing has been cemented for perforating.

There are six pay sands in Sligo field. They are: Paluxy gas sand, Herold oil sand, Jeter and Pettit gas sands, and the new pays, Travis Peak and "D" sand of the Cotton Valley.

A core at O. G. Martin and Finn Myrdahl et al 1 Herold-Wallace, wildcat west of Shreveport, had shows of oil and possibly gas in Mooringsport and Rodessa. The wildcat lies 3¾ miles west of Shreveport.

The Mooringsport core had saturated oil sand at 3,774-83 ft., 7 ft. of dense cap and then oil sand from 3,790-3,800 ft. The Rodessa zone had shows in fractured lime from 4,799-4,803 ft., tight lime with uniform oil saturation from 4,809-21 ft., lime with slight show of oil from 4,824-28 ft., lime with odor from 4,828-33 ft., porous lime with stains from 4,902-06 ft., and oolitic lime section from 4,951-5,000 ft. had salt water.

Official completion has been announced at Southwest Gas Producing Co. 1 Shadow, 12-19n-2w, 1 mile east of Unionville field, Lincoln Parish. The Shadow well completed flowing 66.48 bbl. of 56°-gravity oil and 4,800 M.c.f. of gas daily from 8,860-75 ft. in Vaughn sand.

LOUISIANA SUCCESSFUL WILDCATS

Bossier Parish: Natural Gas & Oil Corp. and C. H. Murphy 2 USA, C SE¼ 12-17n-12w, flowed 7,610 M.c.f. of gas from Hosston 6,160-83 ft., 6,204-19 ft. and "D" sand of Cotton Valley 7,910-24 ft., dual completion, new pays in Sligo field, TD 8,370 ft.

De Soto Parish: The Texas Co. 1 Gamble, C NE SW 19-13n-14w, pumped 33 bbl. of 33.5°-gravity oil from lower Paluxy 4,218-24 ft., TD 7,170 ft. (discovery tentatively named Grand Cane North).

LOUUISIANA WILDCAT FAILURE

Catahoula Parish: Justiss, Mears and Campbell 1 Womack, 660 ft. S and 4,620 ft. E NWc Sec. 3 in Sec. 37-8n-5e, dry, TD 5,644 ft.

ARKANSAS WILDCAT FAILURE

Ouachita County: T. F. Boyd et al, 1 J. J. Walker, C NE NE SW 9-14s-18w, dry, TD 2,107 ft.

Appalachian-Ohio

New Wildcat Announced In Pennsylvania Leidy Area

PITTSBURGH.—The California Co. is now rigging up 1 Byron Schneider, exploratory well in the extreme north central part of Lycoming County, Pennsylvania. The location is east and slightly north of Leidy gas field. Cable tools will be used. The California Co.'s first well in Pennsylvania, 1 A. E. Bennett, in the Munsey area of Sullivan County, was drilled to 12,321 ft., being completed as dry late last year in the absence of any commercial shows of oil or gas.

In Westmoreland County, Unity Township, Peoples Natural Gas Co. 4003 A. J. Dotterway, elevation 2,094 ft., remains shut down at a depth of 8,145 ft., while the 4008 J. R. Frola is drilling at 1,050 ft.

West Virginia.—In Roaring Creek district, Randolph County, Nollem Oil & Gas Co., Agt., announced location for 2 Goff-Arnold Land Co., elevation 2,736 ft., Sago Quadrangle. On this same farm but in Middle Fork district, the No. 3 has also been staked. These locations are southwest of 1 wildcat completed in March with a good open flow of gas in the fifth sand. A deep test has been staked in Union district, Preston County. In Big Creek district McDowell County, Godfrey L. Cabot, Inc., completed two good gas wells in the Berea sand, one for 1,107 M.c.f. of gas and the other for 1,212 M.c.f.

Maryland.—In Garrett County, Maryland, two wells were completed, one for gas and the other dry. Three new locations have been made and preparations are under way to deepen a well, the Columbia Carbon Co. 1 N. K. Welch.

MARYLAND SUCCESSFUL WILDCAT

Garrett County: Loch Lynn Corp. 1 Nellie Lee, elev. 2,416 ft., 125 M.c.f. of gas, Tully 2,822 ft., chert 3,404 ft., TD 3,439 ft.

MARYLAND WILDCAT FAILURE

Garrett County: Mid-Atlantic Oil & Gas Co. 1 B&O RR Co., elev. 2,400 ft., dry, TD 3,695 ft.

OHIO

Yocum et al. completed a gasser on James Fink, Section 12, Hopewell Township, Muskingum County, that has caused some leasing activity. Clinton sand at 3,153-3,200 ft. gaged 1,000,000 cu. ft. natural, and gas was shut in the casing 15 minutes after shot at a gage of 2,500,000 cu. ft.

The Mid East Oil completed a semiwildcat on W. E. Moyer, Lot 33, Casa Township, Muskingum County. Clinton at 3,635-95 ft. gaged 270,000 cu. ft. natural, and increased to 600,000 cu. ft. 1 hour after a 60-qt. shot.

The Ohio Fuel Gas 1 Ferd Moore, Section 8, Bearfield Township, Perry County, a northeast offset to the wildcat on Paskell, topped the Clinton at 3,474 ft. and was drilled to 3,494 ft. The well was tubed natural with an open flow of 2,800,000 cu. ft. and a rock of 1,000 psi.

OHIO WILDCAT FAILURE

Summit County, Copley Township: Ed Obermiller et al. 1 Lee Gamauf, Lot 33, Clinton 3,695-3,708 ft., TD 3,743 ft.

Eastern Texas

Deep Test on Tap For East Sherman Pool

DALLAS.—A try for deep production in the relatively shallow East Sherman pool of Grayson County has been scheduled by Standard Oil Co. of Texas. Location for its 1-A Beth Brown was made between two 3,500-ft. producers in the H. C. Atchison Survey, on the eastern skirts of the town of Sherman. Projected depth was 11,500 ft.

Humble Oil & Refining Co. 1 Trinity University extended Woodbine production southwest of Ham-Gossett field in Kaufman County with a potential gage of 320 bbl. daily through ¼-in. choke from perforations at 3,586-92 ft. Top of pay was 3,348 ft. At 3,359-64 ft. the well flowed oil at the rate of 79 bbl. a day through ¼-in. tubing choke.

Texas Eastern Production Co. 1 J. W. Summers Estate, Cherokee County wildcat southwest of Woodbine gas production in Sessions field, and separated by a dry hole, was drilling in shale at 5,830 ft. after recovering some oil on a drill-stem test in the Woodbine at 4,432-45 ft. The tool was open 30 minutes, which had gas at the top in 5 minutes and recovered 150 ft. of salt water and 20 ft. of oil.

In Collin County Stephens Petroleum Co. 1 Adams, 4 miles northeast of Frisco, was reported dry at 7,898 ft. Tentative top on the Ellenburger was 7,496 ft. Collin County has one other drilling well, at Deep Rock Oil Co. 1 W. M. Sherley, projected 9,000-ft. venture 2 miles north of Valdasta, which was drilling below 4,264 ft. at last report.

Humble 1 Fred Marberry, Freestone County Smackover wildcat, had total depth at 13,476 ft. and was running electric logs. No shows have been reported below the Pettit around 7,000 ft.

In Woodlawn field of Harrison County, Stanolind Oil & Gas Co. 1-B Davis Gas unit was waiting on potential after gaging 200,000 cu. ft. of gas a day from Pettit perforations at 6,452-66 and 6,480-6,528 ft.

EAST TEXAS (DISTRICTS 5 AND 6) WILDCAT FAILURES

Gregg County: British American Oil Producing Co. 1 J. M. Spinks, H. Edwards Sur., dry, TD 7,700 ft.

Wood County: Reserve Petroleum Co. 1 Morgan Reese, J. Y. Steward Sur., dry, TD 4,764 ft., elev. 550 ft., Woodbine 4,690 ft.

Texas Gulf Coast

Karnes Gas-Distillate Discovery Completed

HOUSTON.—Brazos Oil & Gas Co. has completed 1 Rudolph Kruse for 3,250,000 cu. ft. of gas daily on calculated open flow with gas-liquid ratio of 28,337-1 and a flow of 60°-gravity distillate, 6 miles southeast of Runge, Karnes County. The new discovery was finaled through perforations at 7,208-14 ft. On a 24/64-in. choke the well gaged 2,814,000 cu. ft. of gas per day plus 99.31 bbl. of 60°-gravity distillate. Hole is bottomed at 7,521 ft. with 5½-in. casing at 7,274 ft. Location is in Victor Blanco Survey A-3.

Anderson-Prichard Oil Corp. has squeezed perforations 9,673-83 ft. in 1 R. A. Johnson, Colorado County wildcat, 1 mile north of Frelsburg production, and perforated higher at 9,652-64 ft. with 48 shots. On test with packer at 9,634 ft., ⅜-in. bottom and ¼-in. top chokes, gas surfaced in 4 minutes and fluid in 25 minutes under working pressure of 1,500 psi. On ⅜-in. choke well flowed mud and gas for 30 minutes with 2,100 psi. working pressure at the surface. Choke was changed to ¼-in. and after flowing 1 hour well was turned into separators. On 13-hour test well flowed 2,200,000 cu. ft. of gas per day and 76.59 bbl. of 50°-gravity distillate with gas-liquid ratio registering 15,550-1 under pressure of 2,375 psi. Location is in Edward Ruhman Survey, A-479, 1½ miles southwest of New Ulm.

Magnolia Petroleum Co. recovered gas on two drill-stem tests in 3 Ethel Cornelius, third test in Wadsworth area of Matagorda County, from perforations in the 10,300-ft. zone. On perforations 10,313-320 ft. with tool open 1½ hours, recovery was 4,000 ft. of water cushion, 1,170 ft. of salt water cut with gas, and no oil with bottom-hole flowing pressure 2,400 psi. and 6,800 psi. shut-in pressure. Test on reperforations 10,279-289 with 68 shots after squeezing with 200 sacks blew for 50 minutes and died using ¼-in. chokes and 4,000 ft. of water cushion. With tool open 1¼ hours recovered was water cushion, 75 ft. salt water, 65 ft. gas-cut mud, and bottom-hole flowing pressure gaged 2,040 lb. Shut-in pressure registered 4,200 lb.

Third test in area, bottomed at 12,010 ft. is in J. C. Peyton Survey, A-74, 3 miles northeast of Wadsworth. Magnolia opened the reservoir at 1 Cornelius in September 1951, completed through perforations 11,375-85 ft. for 10,067,000 cu. ft. of gas and 192 bbl. of distillate, 46° gravity, per day. The 2 Cornelius made 25,000,000 cu. ft. on calculated open flow under gas-liquid ratio of 21,350-1 and flow of 52°-gravity distillate from perforations 10,369-385 ft.

Shell Oil Co. 1 Kirby Lumber Corp. Tract 110-A, wildcat discovery in Hardin County, 2½ miles southwest of West Village Mills field, was finaled through 66-shot perforations 7,074-86 ft. for 19.8 bbl. of 19.6°-gravity oil per day on 8/64-in. choke under tubing pressure of 1,220 psi. Gas-oil ratio registered 18,700-1 with 50 per cent water in the flow. Hole was made to 7,306 ft. and 5½-in. production string cemented to 7,248 ft. Two-inch tubing was swung at 7,061 ft. Location is in H. & T. C. RR Survey, 219, and is 2,250 ft. southeast of Shell 1 Kirby Lumber Corp. dry hole bottomed at 9,006 ft.

TEXAS GULF COAST (DISTRICTS 2 AND 3) SUCCESSFUL WILDCATS

Brazoria County: new pay at Chocolate Bayou — Phillips Petroleum Co. 1-A, Houston "R," E. Andrews League, Abstract 5, TD 13,658 ft., Andrau 12,846½-54½ ft., IP 12,100,000 cu. ft. of gas per day open flow, plus 80 bbl. of condensate, 45.7° gravity.

Fayette County: oil discovery—Sutton Drilling Co. 2 E. A. Arnim, William Kuykendall Sur., TD 2,210 ft., Wilcox 2,150-55 ft., IP 81 bbl. oil per day, 18/64-in. choke, TP 120 psi., 23° gravity.

Lavaca County: gas-condensate discovery—Alex Head 1 Stella Woytek et al, James Campbell Sur., A-6, TD 9,212 ft., Wilcox 8,540-56 ft., IP 9,000,000 cu. ft. of gas per day plus 125 bbl. of condensate per million, open flow.

TEXAS GULF COAST (DISTRICTS 2 AND 3) WILDCAT FAILURES

Brazoria County: Brazos Oil & Gas Co. 1 F. M. Pearce, ACH&B Sur., A-403, dry, TD 7,778 ft.

John S. Neilson & W. E. Walker 1 Kitty Nash Groce, James & Phelps Sur. 3, A-117, dry, TD 9,515 ft.

Goliad County: James G. McCarrick 1 Mrs. F. Hall et al, David N. White Sur., A-291, dry, TD 3,948 ft.

Toklan Production Co. 1 J. W. Wilson, Noah G. Stebbins Sur., dry, TD 5,415 ft.

Grimes County: Placid Oil Co. 1 Paul & William Thomas, Obedience Hill Sur., A-254, dry, TD 10,234 ft.

Hardin County: Floyd L. Karsten 5 Alexander Deussen, Francisco Arriolla Sur., A-2, dry, TD 10,100 ft.

Shell Oil Co. 1 Kirby Lumber Corp. Tract

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107-A, H&TC RR Co. Sur., dry, TD 7,301 ft.

Victoria County: M. E. Andrews, Ltd., Husky et al, 1 Mrs. Etta Terrell, Maris de Jesus de Leon Sur., dry, TD 4,504 ft.

Forest Oil Corp. 1 R. H. Welder "A," SA&MG RR Sur., A-238, dry, TD 8,975 ft.

R. N. Ranger 1 William Krahl, Francisco Ramon Sur., A-95, dry, TD 6,510 ft.

Washington County: Carnes W. Weaver 1 Charles Hinze, O. Hudson Sur., dry, TD 9,300 ft.

Mississippi

Southeastern Drilling At Temporary Low Ebb

JACKSON.—Drilling activity in the southeastern area (Mississippi, Alabama, Florida) is presently at a low ebb. This is thought to be a temporary situation. During the past year a great amount of acreage has been leased in the Paleozoic area of northeastern Mississippi and northwestern Alabama which is now being explored and should be followed by the drilling of test wells. The same is true of southern Alabama and northern Florida, where a vast lease play followed Pollard field discovery.

In the Goshen Springs area, Rankin County, Mississippi, the closely watched deep Smackover wildcat, Lion Oil Co. 2 Denkmann, 22-7n-4e, was waiting on casing to be transported to location. Drill-pipe was stuck while coring in sand at total depth of 16,276 ft. Pipe was backed off at 15,245 ft. and was fished out to 15,762 ft. A long string of 5-in. o.d. casing is to be run inside the 7-in. casing which was set at 15,088 ft. The 5-in. casing is to be set just above top of fish and the bottom sand section, 15,997-16,276 ft., is to be tested from open hole.

In Baxterville field, Lamar County, Mississippi, the Gulf Refining Co. 25 Andrews, deep test located in 6-1n-16w, encountered brown oil stain and slight fluorescence in samples at 11,312 ft. Coring was started at this depth and at last report core was being pulled. This is the first interesting show that has been reported since 3,063 ft. of 40.7°-gravity oil was recovered on 12-minute drill-stem test at 10,829-70 ft.

In northern Madison County, Mississippi, approximately 3¼ miles southeast of the one-well Virlillia field, the Continental Oil Co. 1 Lee, 4-9n-2e, is drilling below 11,500 ft. in Cotton Valley. The Hosston gravel section from which the Virlillia well was completed carried no shows in subject test and was reported as being approximately 50 ft. low structurally. Operators are drilling ahead to explore the Smackover section which was topped at 13,717 ft. in the Virlillia well.

In southern Forrest County, Mississippi, the prospective new gas condensate discovery, Ohio Oil Co. 1 Coleman-Powe, 5-1s-12w, is reported drilling below 8,700 ft., but no detailed information has been released on the operations below 7,315 ft.

The persistent and rather well accepted rumors are that over 40 ft. of rather rich gas-condensate sand was cored and tested in the upper part of the lower Tuscaloosa, but the Massive sand section carried salt water. If these rumors are true, subject test could be one of the best and most significant discoveries in southern Mississippi in quite some time.

In Wilkinson County, Mississippi, Wilkinson field discovery well, Gulf Refining Co. 5 Crosby Lumber Co., 23-3n-2w, has been completed with initial potential of 67 bbl. of 34.5°-gravity oil per day through 9/64-in. choke with tubing pressure 205 psi. Completion was from perforations 7,160-66 ft. opposite Wilcox sand.

MISSISSIPPI SUCCESSFUL WILDCAT

Wilkinson County: oil discovery "Wilkinson" —Gulf Refining Co. 5 Crosby Lumber Co., 23-3n-2w, TD 7,561 ft., Wilcox 7,164-66 ft., IP 67 bbl. of oil per day, 11/64-in. choke, TP 220 psi., 34.5° gravity.

MISSISSIPPI WILDCAT FAILURE

Wilkinson County: Dave Gammill-L. Cashion Co. 1 Crosby Lumber Co., 14-4n-2w, dry, TD 7,014 ft.

Petersen Drilling Co. 1 Mrs. H. D. Bennett, 38-3n-3w, dry, TD 7,804 ft.

ALABAMA WILDCAT FAILURE

Cullman County: Cullman Oil & Drilling Co. 1 J. W. Collum, 36-8s-4w, dry, TD 2,085 ft.

Canadian Fields

Record Rate of Discoveries Reported in Canada Areas

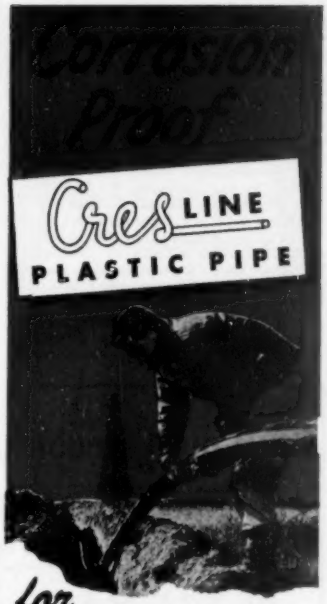
CALGARY.—During the first 4½ months of this year there were 54 indicated discoveries of crude oil and/or natural gas in western Canada, a record rate averaging about one discovery every two days. Twenty of those wells found oil or oil encouragement, while 34 struck natural gas or wet gas flows.

Alberta, the western province which is receiving the lion's share of exploratory activity accounted for over 70 per cent of the discoveries so far this year, 39 in all. Sixteen of these strikes were oil or indicated oil discoveries, all but two being on the central plains of the province. The remaining 23 strikes were gas finds, which makes the rate of natural gas discovery in Alberta during the initial 105 day period of 1952 greater than one new gas strike every five days.

It is anticipated that the discovery rate, for both oil and gas, will be further increased as operators intensify their exploratory program during the summer months. At the present time there are some 73 drilling rigs working at wildcats in Alberta, and additional rigs are being brought in, scheduled to drill at exploratory ventures in this province.

A sizable boost in Alberta's gas reserves have been effected so far in 1952 by the province's 23 indicated gas discoveries, and by the numerous other wells that have been rated as extension successes to already discovered gas fields. If the province decides to export natural gas in greater volume than already specified, the gas discovery rate will climb considerably, as numerous of the gas strikes have been made only incidental to the search for oil. A further market outlet for gas reserves would add greater incentive to the petroleum explorers.

A dozen of Alberta's natural gas finds during the 4½ month period were made in the central portion of the province, Alberta's most active exploratory and development area. Six of the new discoveries are in the northwest, or general Peace River region that is designated for gas export to the west



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coast. Three new strikes are in the southern sector, while two are in the northeast portion of Alberta.

British Columbia is receiving a high volume of exploratory activity, particularly the northeast sector of that province. The equivalent of eight discoveries have been made in B.C. to date in 1952, including 7 gas strikes and one oil find. Greatest activity is in the general Fort St. John area, where four wells have resulted in the equivalent of six gas discoveries and one indicated oil discovery. A number of those wells have found gas and/or oil in various formations. In addition, several extensions in already discovered gas horizons have been made. Discoveries were made in the Cadomin, upper and mid-Triassic and Permo-Pennsylvanian formations.

In the southeast sector of British Colombia in the Flathead Valley area, a moderate flow of gas was discovered at a wildcat venture. This strike was made in an unidentified sand section, and may not be capable of producing in commercial volume.

Saskatchewan has recorded seven discoveries during the initial 105 days of 1952, including four oil and three gas. The intensified program of exploration in Saskatchewan, currently in progress as a result of the discoveries made north of the international border, and south of that line, will undoubtedly yield numerous other oil and gas reserves in the province.

CANADIAN WILDCAT FAILURES

Preferred—Jet Richfield 1 North Joseph Lake, LSD 12 29-51-22w4, TD 3,963 ft.

Calvan 6-29 Medicine Hat, LSD 6 29-12-3w4, TD 3,292 ft.

Hudson's Bay et al 3 Olds, LSD 7 13-31-28w4, TD 8,226 ft.

Can-Tex Atlantis Socony 1 New Norway, LSD 3 12-45-21w4, TD 5,560 ft.

Hanna & Associates Sun 1, Veteran, LSD 4 10-35-8w4, TD 3,795 ft.

Imperial 12-20 Wanham, LSD 12 20-77-3w6, TD 9,347 ft.

EASTERN CANADA

In Aldborough Township, Western Ashley-Wardsville, No. 2, ¼ mile west of No. 1 gasser and ½ mile southwest of Wardsville, at 150 ft. hit a huge pocket of gas which shot the bit 150 ft. in the air. Flow was estimated at 20,000,000 cu. ft. a day. The well is being deepened.

Quebec.—In the Gaspe Peninsula, Associated Developments, Ltd., financed by a Montreal group, has obtained a permit to explore for oil and gas in the Gaspe Peninsula. The provincial government is considering an application from the same company for a similar permit for Anticosti Island, in the St. Lawrence. The company is planning to spend about $200,000 in development in southeastern Quebec. Drilling for oil has been carried on in Gaspe intermittently for more than 50 years, numerous showings being found but without sustained commercial production.

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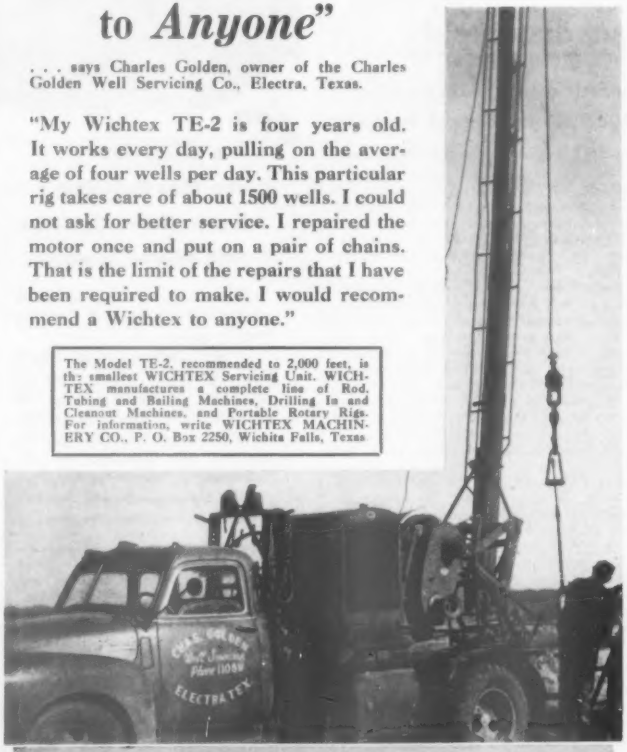

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WICHITA FALLS, TEXAS

Kansas

Ellis County Wildcat Produces From Lansing

FLOURNEY, HOSTON & ANSCHULTZ DRILLING CO. are opening another producing area in southeastern Ellis County at their 1 Hertel, NE NE NW 16-14s-16w, 3 miles east of Victoria. With casing perforated at 3,164-72 ft. in the Lansing-Kansas City lime, the well produced at the rate of 9 to 10 bbl. of oil per hour in swabbing tests after acidization, and now is being put on the pump for completion. Hole had been plugged back to 3,190 ft. from Arbuckle lime, after tests in the deeper zone proved unsuccessful. Arbuckle was topped at 3,283 ft. and drilled to 3,391 ft. Top of the Lansing was logged at 3,112 ft.

Another oil discovery is indicated in eastern Rooks County, where Herndon Drilling Co. has casing run to test showings obtained in Arbuckle lime at its 1 Chesney, NE NW SE 18-8s-16w. Arbuckle was logged from 3,645 ft. to 3,667 ft. (total depth). A drillstem from 3,649 ft. to bottom got 120 ft. of clean oil with 180 ft. of oil and gas-cut mud, 180 ft. of muddy oil, and 180 ft. of gassy oil. The area is 8½ miles southeast of Stockton.

Petroleum, Inc., 1 White, which opens a new productive spot southwest of Laura in southeastern Graham County, pumped 154 bbl. of oil per day in potential tests. Pay zone is Arbuckle lime, open below 3,716 ft. to 3,721 ft., total depth. It previously swabbed 2 to 3 bbl. of oil per hour. Location is in the NW NW SW 25-10-21.

B & R Drilling Co. and Davis Brothers 1 Johnson, prospective discovery well located in the NW NW NW 31-13-28, 4½ miles south of Gove, in Gove County, swabbed at the rate of 1 bbl. of oil and 2 bbl. of water per hour while testing a prospective Mississippi lime pay zone, open at 4,505-90 ft. Hole has been plugged back to the Lansing section, in which casing is being perforated for additional tests. Location is 3½ miles northeast of the Coberly pool, the county's first production, opened more than a year ago. The latter pool produces from Marmaton lime.

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KANSAS SUCCESSFUL WILDCATS

Cowley County: J. Aylward et al 1 Canfield, NE NE NW 13-34s-3e, pumped 13.25 bbl. of oil from Bartlesville 3,376-79 ft., TD 3,381 ft.

J. Aylward 1 Land & Power, SW SW SW 23-34s-3e, pumped 58.3 bbl. of oil from Bartlesville 3,291-95 ft., TD 3,354 ft. PBTD 3,295 ft. (opens Arkansas City West pool).

Ellsworth County: Skelly Oil Co. 1 Stumps, SW SW SE 25-17s-10w, pumped 50 bbl. oil from Lansing-Kansas City 2,974-91 ft., TD 3,327 ft. (new pay in Heiken pool).

Stafford County: Birmingham & Bartlett 1 Dohrmann, NE NE SW 33-22s-12w, pumped 334 bbl. of oil from Lansing-

(Continued on page 275)

Permian Basin

Ellenburger Extension Promised Upton County

MIDLAND.—Wilshire Oil Co. 23-130 McElroy Ranch Co. looked promising as a flush Ellenburger extension well on the north side of Wilshire-Ellenburger field in Upton County.

On a drill-stem test between 12,055-225 ft., oil flowed in 36 minutes, gaging 158 and 157 bbl. of 54°-gravity oil on the first and second hourly gages. The flow was through 1-in. top and bottom openings, with bottom-hole flowing pressure of around 5,000 psi. Casing was being run for completion.

West of production, Wilshire 14-130 McElroy had fractures and bleeding oil in a core from 12,065-86 ft., identified as the Joines dolomite. It was coring ahead.

Sinclair Oil & Gas Co. 9 McElroy, development well on the east side of the field, extended production 1 location when it completed for 2,905 bbl. of oil a day, through open 2-in. tubing, from pay at 12,350-450 ft.

North of Pegasus field, Superior Oil Co. 4-16 Windham logged further oil in the Ellenburger. A drill-stem test at 13,096-178 ft. developed 1,170 ft. of heavily oil-cut mud and 180 ft. of clean oil. A test from 13,099-188 ft. developed 3,510 ft. of clean, 47°-gravity oil. After a 90-minute test from 13,094-203 ft. the well started unloading the 3,000-ft. water blanket after the 28th stand of pipe had been pulled, then unloaded 8,000 ft. of oil and mud. Following the test it was reported as flowing and blowing oil, with no estimate on recovery.

Northwest of shallow Means field in Andrews County, Gulf Oil Corp. 1-A McQuarters had top of the Devonian at 11,960 ft., minus 8,761 ft. Bottom 3 ft. of a core between 11,981-12,020 ft. was lime with oil stains.

Fogelson and Pauley 13-42 Boyd completed as a Spraberry discovery in 42-B-L&SV, approximately midway between Aldwell and Weddell Spraberry fields in Reagan County. Completion potential was 228.6 bbl. of oil a day, through ¾-in. choke from perforations at 7,421-27 ft., and without acid treatment. Top of pay was 7,377 ft., on elevation of 2,675 ft.

Gulf Oil Corp. 712-H C. A. Goldsmith marked the 6th oil-pay zone for Goldsmith field of Ector County. The well, in Section 4, Block 44, completed for 503 bbl. of 40°-gravity oil a day from open hole between 5,088-5,120 ft.

In Coke County, north of Bronte field, Humble Oil & Refining Co. 1 Rawlings developed 3,870 ft. of 46°-gravity oil on a

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35-minute drill-stem test in a Pennsylvanian sand from 5,165-80 ft. It was drilled ahead to 5,200 ft., still in the sand and showing oil in the samples.

WEST TEXAS (DISTRICTS 8 AND 7-C) SUCCESSFUL WILDCATS

Andrews County: Kerr-McGee Oil Industries 11-C-23 University, 23-11-University Lands, TD 9,200 ft., elev. 3,311 ft., PB 6,507 ft., pay 6,430 ft., IP 78 bbl. 39°-gravity oil, ½-in. choke, TP 120 psi., GOR 1,600 cu. ft.

Phillips Petroleum Co. 1-EE University Lands, Blk. 12 area, TD 11,065 ft., elev. 3,307 ft., Ellenburger 10,655 ft., perforated 10,884-978 ft., IP 1,498 bbl. 44°-gravity oil, ½-in. choke, TP 550 psi., GOR 500 cu. ft.

Gaines County: The Texas Co. 1-B E. H. Jones, 454-G-CCSD&RGNG, TD 7,900 ft., elev. 3,586 ft., Tubb 7,280 ft., pay 7,390 ft., IP 56 bbl. 33°-gravity oil, ½-in. choke, TP 260 psi., GOR 368 cu. ft.

Runnels County: T. D. Humphrey 2 J. L. Elkin Estate, Blk. 13, N. Travis Sur., 533, TD 2,470 ft., McMillan sand 2,464 ft., IP pumped 76.5 bbl. 42°-gravity oil.

WEST TEXAS (DISTRICTS 8 AND 7-C) WILDCAT FAILURES

Andrews County: J. C. Barnes 1 Lockhart & Brown, 13-A41-PSL, dry, TD 7,145 ft., elev. 3,300 ft., San Andres 4,260 ft., Glorietta 5,400 ft.

Ohio Oil Co. 1-M-32133 University, 28-11-University Lands, dry, TD 8,568 ft., Devonian 8,150 ft., Silurian 8,545 ft.

Ector County: Jackson, Douglas & Ritchie 1 Earl Vest, 18-B8-PSL, dry, TD 9,794 ft., elev. 2,961 ft., Woodford 8,998 ft., Devonian 9,294 ft.

Howard County: Stanolind Oil & Gas Co. 1-D TXL, 23-32-T1S-T&P, dry, TD 10,013 ft. elev. 2,615 ft., Spraberry 5,455 ft., Bend 8,860 ft., Mississippian 9,355 ft., Ellenburger 9,805 ft.

Kent County: Paul C. Teas 1 George Beggs, 53-7-H&GN, dry, TD 7,257 ft., elev. 2,255 ft., Clear Fork 2,450 ft., Canyon 6,880 ft.

King County: Wrightsman Oil Co. 1 W. R. Ross, Sec. 89, John Rector Sur., dry, TD 5,562 ft., Strawn 5,110 ft., Ross Ranch reef 5,448 ft.

Martin County: E. M. Craig, Jr. 1 E. M. Schenecker, 18-38-T1N-T&P, dry, TD 4,390 ft., elev. 2,788 ft., Grayburg 4,075 ft.

Runnels County: G. B. Cree 2 H. A. Stephens, C. A. Parker Sur., 16, dry, TD 3,994 ft.

Schleicher County: Headwaters Oil Co. 1 Mrs. R. F. Spencer, 53-A-J, Gibson Sur., dry, TD 5,521 ft., Strawn 4,770 ft., Ellenburger 5,260 ft.

Stanolind Oil & Gas Co. 1 Augusta West, 79-A-HE&WT, dry, TD 8,250 ft., Strawn 6,963 ft., Ellenburger 7,175 ft.

Sutton County: W. M. and A. P. Fuller 1 Lea Allison, 17-A9-Georgetown RR Sur., dry, TD 7,020 ft., elev. 2,382 ft., Strawn 5,471 ft., Ellenburger 6,750 ft.

Tom Green County: Signal Oil & Gas Co. 1 W. E. Schulkey, W. Schirmacher Sur., 752, dry, TD 5,612 ft., Canyon 5,417 ft., Strawn 5,470 ft.

SOUTHEASTERN NEW MEXICO

Richardson & Bass were rigging up for a 14,500-ft. wildcat in east-central Eddy County. The deep test will be drilled as the 1 George H. Cobb-Federal, in 23-20s-31e, which is some 11 miles northwest of Buffalo Oil Co.'s deep Devonian discovery.

In Lea County, Wilshire Oil Co. 1 Townsend, 4-16s-35e, completed as a Pennsylvanian discovery. The well gaged 222 bbl. of 40°-gravity oil in 18 hours through ½-in. choke from perforations at 10,410-500 ft. Wilshire made location for its 3 Townsend ½ mile west of the discovery.

Amerada Petroleum Corp. 1-MA State, north offset to The Texas Co. 1 Moore, Devonian discovery, flowed 70 bbl. of oil in 4 hours on drill-stem test of the Pennsylvanian from 8,421-8,510 ft. Recovery included 180 ft. of salt water. A later test at 8,521-8,630 ft. recovered 190 ft. of gas-cut mud and 290 ft. of salt water, and operators were drilling ahead below 8,631 ft.

SOUTHEAST NEW MEXICO SUCCESSFUL WILDCAT

Lea County: Drilling & Exploration Co. 1-Q State, 32-20s-39e, TD 4,360 ft., elev. 3,553 ft., pay 4,292 ft., IP pumped 32 bbl. 31°-gravity oil.

SOUTHEAST NEW MEXICO WILDCAT FAILURES

Eddy County: Lubbock Machine Co. 1 Cockerham, 34-18s-26e, dry, TD 3,893 ft.

Malco Refining Co. 2 W. M. Boyd, 14-19s-25e, dry, TD 790 ft.

Lea County: General American Oil Co. 1 Harper, 4-20s-25e, dry, TD 6,054 ft., elev. 3,176 ft., Delaware sand 5,103 ft.

TEXAS PANHANDLE

Gulf Oil Corp. has indications of discovering the most important new pool since the opening of Panhandle field at 2 John Haggard, 153 ft. from south line and 2,470 ft. from west line, Section 5, Block 2, I&GN

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Survey. The new discovery flowed 78 bbl. of 51°-gravity oil on initial gage in 6 hours from Brown dolomite at 4,009-15 ft. Gas flowed at the rate of 8,300 M.c.f. per day. Well was shut-in.

The promising wildcat is located 8 miles west and 2 miles north of Miami in Roberts County.

In Hutchinson County The Texas Co. will complete 1 Holt, a new gas discovery. Field opener is located 1,980 ft. from north and west lines of Section 52, Block 5-T, T&NO Survey. Crews tested 3,500 M.c.f. of gas daily from treated Douglas sand at 4,965-78 ft. Gas will be produced also from 6,004-29 ft.

North-Central Texas

Gas-Distillate Strike Looms in Stephens County

WICHITA FALLS.—A gas-distillate discovery was in sight for Stephens County, 4 miles south of Caddo, and deep exploratory wildcats had been scheduled for Clay and Montague counties.

The new prospect was Terrell Petroleum Co. 1 L. C. Link, 25-6-T&P, testing on perforations at 4,320-46 ft. After mud-acid treatment the well made an estimated 32,000,000 cu. ft. of gas a day, plus 50 bbl. of distillate.

Frank Wood Associates, Inc. 1 Viola Myers, 3 miles southwest of Henrietta in Clay County, was projected to 6,750 ft. Location is in the M. B. Skerrett Survey. Montague County's deep wildcat is American Production Corp. 1 A. J. Fenoglio, M. A. Sappington Survey, which is 1 mile northwest of the Montague townsite. Proposed depth was 7,423 ft.

Southeast of Ringgold, two completions have confirmed Caddo conglomerate production recently discovered by Luke Grace Drilling Co. 1 Milan. The same firm's 1-B Milan gaged 73½ bbl. of oil a day through 8/64-in. choke from pay at 5,673-88 ft. Total depth was 5,780 ft. The company's 1-C Milan was drilled to 5,655 ft. and had pay at 5,640 ft. Potential on 8/64-in. choke was 71 bbl. of oil. Both wells are in Block 54, A. Benson Survey.

A small Fry sand discovery completed in Coleman County, just southeast of Valera. E. F. White, Jr. 1 Edith Anson Boulware, 16-1-GH&H, pumped 40 bbl. of 44°-gravity oil a day, plus some water, from pay sand at 2,604-05 ft.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) SUCCESSFUL WILDCATS

Archer County: Double L Drilling Co. 2-A Threet, S. J. Williams Sur., A-704, TD 975½ ft., pay 975 ft., IP pumped 8 bbl. 34°-gravity oil.

Callahan County: Continental Oil Co. 1 Ruth Hutchinson, Sec. 119, BBB&C Sur., TD 4,485 ft., Ellenburger pay 4,378 ft., IP 96.6 bbl. 40°-gravity oil a day, TP psi., GOR 6,118 cu. ft.

Coleman County: Davis Drilling Co. 1 Lela Bell, 3-1-GH&H, TD 1,995 ft., pay 1,908 ft., IP pumped 74 bbl. 42°-gravity oil.

Louis Franklin 1 Ozro Eubanks, Manuel Martinez Sur., 751, TD 1,527 ft., pay 1,520 ft., IP pumped 12 bbl. 33°-gravity oil.

Eastland County: Jim M. Gamblin, Agent 1 Raney Heirs, 52-4-H&TC, TD 1,696 ft., elev. 1,490 ft., gas pay 1,693 ft., IP 7,600,000 cu. ft., open flow.

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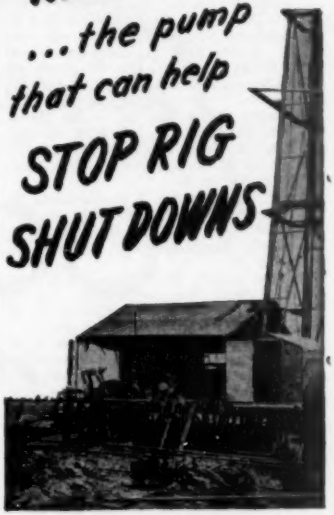
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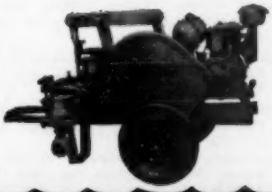
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22-4-H&TC, TD 3,702 ft., elev. 1,543 ft., Ranger sand pay 3,587 ft., IP 2,190,000 cu. ft. of gas, SIP 1,295 psi.

Jones County: Robinson-Puckett, Inc. 5, J. T. Casady, Sec. 49, D&DL, TD 2,191 ft., elev. 1,607 ft., pay 2,178 ft., IP pumped 151 bbl. 39°-gravity oil.

Montague County: A. R. Dillard 2 M. Fowler, R. M. Davis Sur., A-181, TD 6,141 ft., elev. 917 ft., pay 6,137 ft., IP 180 bbl. 42°-gravity oil, ¼-in. choke, TP 350 psi., GOR 500 cu. ft.

J. G. Dyer 1 J. E. Zachery, Sec. 135, J. C. Mattison Sur., TD 5,925 ft., elec. 913 ft., Caddo 5,792 ft., conglomerate pay 5,871-86 ft., IP 353 bbl. 40°-gravity oil, ¼-in. choke, TP 425 psi., GOR 410 cu. ft.

Hiawatha Oil & Gas Co. 1 Ida Harris, Blk. 15, Titus CSL, TD 6,260 ft., elev. 1,062 ft., pays 6,250 ft., IP 164 bbl. 41°-gravity oil, 20/64-in. choke, TP 250 psi., GOR 560 cu. ft.

W. T. Waggoner Est. 1 P. Carminati, W. Bennett Sur., A-51, TD 6,440 ft., elev. 1,006 ft., pay 5,982 ft., IP 241 bbl. 42°-gravity oil, ⅜-in. choke, TP 200 psi., GOR 500 cu. ft.

Palo Pinto County: W. F. Hines 1-A Bridges, J. J. Smith Sur., A-410, TD 1,764 ft., elev. 1,042 ft., gas sand 1,752-56 ft., IP estimated 5,000,000 cu. ft. of gas.

Wilbarger County: Frank Wood 4-ZZ W. T. Waggoner, 16-13-H&TC, TD 1,024 ft., pay 1,012 ft., IP pumped 9½ bbl. 40°-gravity oil.

Frank Wood 5-ZZ Waggoner, 16-13-H&TC, TD 1,026 ft., pay 1,016 ft., IP pumped 17 bbl. oil.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) WILDCAT FAILURES

Archer County: R. W. Darden and R. B. Farris 1 Frank Brazina, Blk. 4, W. S. Probert Sur., dry, TD 1,498 ft.

Panhandle Producing & Refining Co. 1 Lucy Est., Blk. 18, Palo Pinto CSL, dry, TD 4,075 ft., elev. 1,060 ft., KMA 3,826 ft.

E. R. Perkins 3 Olin Calvin, Horatio Grooms Sur., A-155, dry, TD 1,120 ft.

Reno Oil Co. 1 R. Garrett, Blk. 13, W. L. Herring Sur., dry, TD 3,895 ft.

Harrold Shappell 1 O. S. Richards, Blk. 16, Anderson Ranch Subd., dry, TD 1,380 ft.

White, Duncan and Lipscomb 1 Prideaux, Blk. 4, I&GN, dry, TD 3,877 ft.

Baylor County: Fortex Oil Corp. 1-B Mills, Sec. 3,137, TE&L, dry, TD 1,495 ft.

Callahan County: C. U. Bay 1-A Dyer, Sec. 41, BBB&C, dry, TD 1,869 ft.

Clay County: Bridwell Oil Co. 20 Bridwell River Ranch, Lot 113, Word & Houssell Subd., dry, TD 5,589 ft.

Coleman County: Texola Drilling Co. 1 S. D. Cupps, Ses. 6, R. Perry Sur., dry, TD 1,158 ft.

Cooke County: Carl T. Anderson 1 H. W. King, MEP&P Sur., A-1,305, dry, TD 3,757 ft.

Erath County: Connally Jackson 1 A. McPherson, Blk. 5, G. W. Treighen Sur., dry, TD 4,311 ft.

Jack County: F. Kirk Johnson 1-B Cherryhomes, W. B. Stephens Sur., dry, TD 5,690 ft.

S. D. Johnson 1 T. H. Cherryhomes, R. O. W. McManus Sur., A-381, dry, TD 5,421 ft.

Jones County: George F. Hammons 1 R. I. Leroy, Sec. 51, D&DAL Sur., dry, TD 3,650 ft.

Nolan County: Headwaters Oil Co. 1 B. K. Stone, 95-X-T&P, dry, TD 6,355 ft., reef 6,232 ft.

Palo Pinto County: J. Clement 1 J. M. McClure, Sec. 1,770 TE&L Sur., dry, TD 1,868 ft.

Throckmorton County: Bridwell Oil Co. 4 Zula Morrison, Sec. 1,642, TE&L Sur., dry, TD 852 ft.

H. B. Mummert, Jr. 1 Everett Est., Sec. 1,622, TE&L Sur., dry, TD 600 ft.

Wichita County: Ted A. Norwood 1-A Obenhaus, MEP&P Sur., A-230, dry, TD 1,860 ft.

Wilbarger County: James Blair Baker 1-Q Waggoner Estate, 4-7-H&TC, dry, TD 2,410 ft.

Young County: Bolin Oil Co. 1-A O. Loving Est., Sec. 2,792, TE&L Sur., dry, TD 3,848 ft.

C. B. Christie 4 E. E. Hall, A. Rohus Sur., A-240, dry, TD 695 ft.

E. B. Clark 1 David S. Vance, Sec. 2,716, TE&L, dry, TD 4,231 ft., Caddo 4,200 ft.

Lebus Bros. 4 H. O. Prideaux, A. McMullen Sur., dry, TD 3,025 ft.

Neeld & Hood Drilling Co. 1 W. P. Stephens, Sec. 1,946, TE&L Sur., dry, TD 3,810 ft.

Oklahoma

Southeast Bradley Well Produces From Springer

TESTING continues at Magnolia Petroleum Co.'s indicated Springer sand well in the Southeast Bradley field, Grady County. The prospective well, second for the field, is 1 Sarah Addison, C SW NW 13-4n-5w, south offset to the discovery well (1 Woodruff), a Hart sand producer, completed early this year. Following a formation fracturing treatment, it recovered load oil and then swabbed 29 bbl. of new oil in the first 12 hours.

Pay zone is an interval at 9,623-30 ft., where a previous drill-stem test, open 5 hours, got 2,000 ft. of oil, with 100 addition ft. of oil-cut mud with 600 ft. of drilling water. Since then a plug has been set at 9,618 ft., just above the pay interval, and a higher zone in the same section opened with perforations at 9,564-85 ft. and 9,594-9,606 ft. Total depth is 10,425 ft., plugged at 9,670 ft.

Gulf Oil Corp. has completed its 2 Mainka-Ring unit, new-pay discovery well, and third producer for the deep Northeast Bradley field, also in Grady County. Producing from Bromide sand with casing perforated at 12,836-13,049 ft., the well is credited with a flow of 2,063 bbl. of 47.8°-gravity oil in 15½ hours through ½-in. choke. Gas flow was at the rate of 9,000,000 cu. ft. per day. Location is northwest of the discovery well, which produces from McLish sand at 13,405-611 ft. (state's deepest production). The field's second producer, located southeast of the discovery well, produces from Hunton lime.

Carter Oil Co.'s new gas-distillate discovery well, 1 Rosendale, C NW SE 22-23n-24w, northern Ellis County, recovered load oil and then flowed 21 bbl. of 52.6°-gravity distillate in 12 hours through ¾-in. choke following a formation fracturing treatment. Flow increased to 27 bbl. in the next 12 hours through the same choke. Gas flow was at the rate of 960,000 cu. ft. per day. Pay zone is Morrow sand, opposite which casing is perforated at 8,455-8,510 ft. The well is 5 miles southeast of Chaney.

Sunray Oil Corp. is starting its first confirmation well for new gas-distillate producing field in southwestern Harper County. The new operation, 1 Long is located in the SW SW SW 3-25n-25w, about ¾ mile southeast of the discovery well, 1 Wolfe, C NW NE 4. The latter well was completed early this month flowing 47 bbl. of 68.2°-gravity distillate and 5,200,000 cu. ft. of gas daily through 1-in. choke. Pay zone is Morrow sand, perforated at 7,190-7,230 ft.

OKLAHOMA SUCCESSFUL WILDCAT

Osage County: Charles W. Oliphant 1 Osage, SW NE NE 12-22n-10e, pumped 125 bbl. of oil from Bartlesville 1,683-1,727 ft., TD 1,754 ft. (extends West Avant pool).

Payne County: Patton Bros. Drilling Co. et al 1 Holderred, SW SW SW 26-18n-4e, pumped 25 bbl. of oil from Bartlesville 3,677-93 ft., TD 3,693 ft. (extends Broyles pool).

OKLAHOMA WILDCAT FAILURES

Cleveland County: Jay Simmons 1 Mason, SW SE 3-7n-1w, dry, TD 7,356 ft.

Harper County: K. A. Ellison 1 Hal Cooper, SW SW NE 2-25n-22w, dry, TD 6,945 ft.

Jefferson County: Davon Oil Co. and Atlantic Refining Co. 1 Payne, SE SE NW 3-5s-6w, dry, TD 5,468 ft.

Kay County: Midstates Pipe & Supply 1 Glen, SE SW NW 17-28n-4e, dry, TD 3,274 ft.

Lincoln County: Smith & Cleary, Inc. 1 Sprague, NE SE SE 6-15n-4e, dry, TD 3,872 ft.

Logan County: Deep Rock Oil Corp. 1 Maud G. Christ, NE NW SE 13-15n-1e, dry, TD 5,465 ft.

E. J. Jordon 1 C. Lovell, SW SE SW 22-15n-1e, dry, TD 5,509 ft.

Osage County: A. G. Oliphant 1 Osage, W½ W½ NW 5-24n-3e, dry, TD 2,908 ft.

Payne County: Warren Oil Corp. 1 Lewis, NW NE SE 9-17n-4e, dry, TD 4,386 ft.

Rocky Mountain

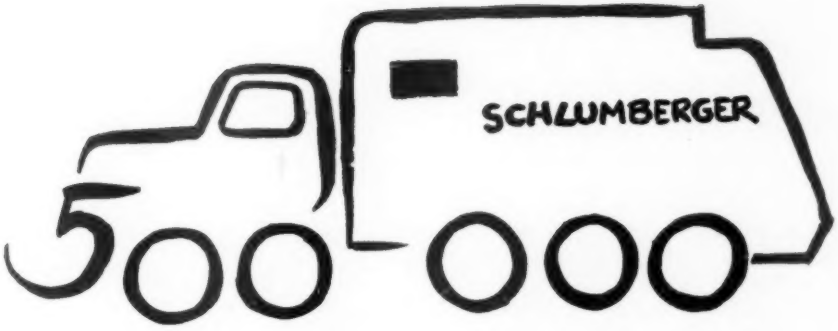
New Williston Discovery Apparent At West Poplar

DENVER.—Ajax Oil Co. of Billings has an apparent new Williston basin discovery in the West Poplar area of Roosevelt County. The company's 1 McGowan, C SE SW 10-[illegible]n-50e, flowed 15-20 bbl. per hour from perforations between 6,164-89 ft. after acidizing with 2,000 gal. early this week. Top of Charles was reported at 5,778 ft., Madison at 6,200 ft. The wildcat is 3½ miles northeast of a recent failure by Carter Oil Co. and Phillips Petroleum Co. in the 1 Unit, C NW SW 18-29n-50e, which went to 7,675 ft. without commercial shows.

The flow of oil at the Ajax discovery was accompanied by gas at the rate of 1,500,000 cu. ft. per day. Casing is set on bottom at 6,274 ft.

Charles production was found in the recent C. H. Murphy, Jr., discovery 1 Unit, C SW NE 2-28n-51e, 7 miles southeast of the Ajax strike. The well will add new emphasis to the already active east-central Montana area, where interest soared with Shell Oil Co.'s announcement of a 6,700 bbl. per day completion potential at an offset to The Texas Co.'s discovery in the Cedar Creek area, Dawson County.

The Texas Co. has announced a new extension in the Cedar Creek area, and Shell is starting a new wildcat in the Richey area to the north, the 22-9 Knudson, C SW NE 9-23n-50e, 3 miles northeast of the Richey discovery. The Shell Oil Co.'s 22-19, SW SE NW 19-23n-50e, may be a surprise failure. It is a southeast offset to the discovery,



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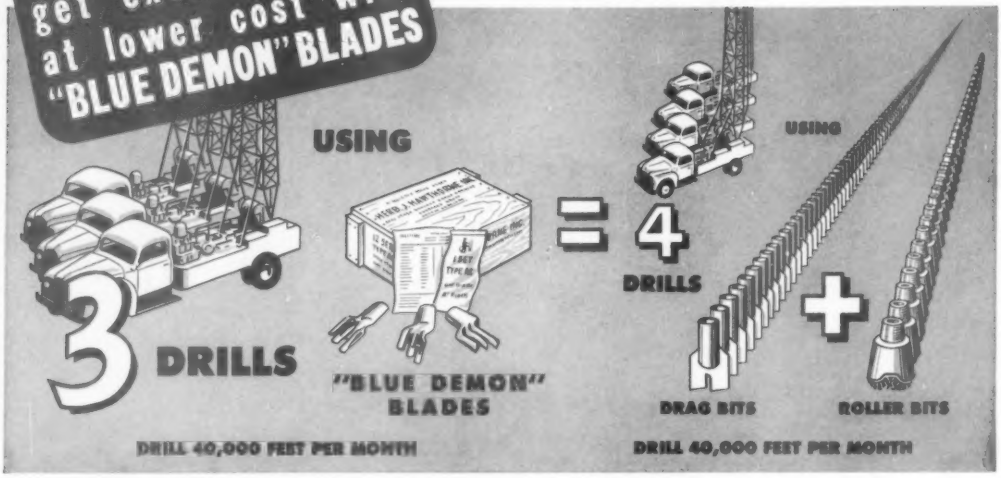

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•

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and is now waiting on orders after testing only gas-cut mud from the zone 7,317-70 ft.

In the North Dakota active portion of the Williston development drilling has accelerated following improvement of weather conditions. There are now 21 active operations in the Beaver Lodge area, counting two which Amerada Petroleum announced last week. Sixteen of the Beaver Lodge area wells are Amerada operations, four are by H. L. Hunt, and one by Tioga Petroleum-American Viking et al. Two of the Amerada wells are wildcats, one of which, the 1 Fretland, C SE SE 25-156n-96w, swabbed small quantities of gas-cut mud last week. The past week saw Amerada make one completion in the field with a potential of 22 bbl. per hour through ¼-in. choke reported from Madison at the 1 Almer Iverson, C NE NE 12-155n-96w, an extension.

Southward, in the Croff area of McKenzie County Amerada continues to test at the 1 Risser, C SW SE 12-149n-96n, with the latest gage reported as 88 bbl. oil, 22 bbl. water through ½-in. choke in 19 hours, with gas at the rate of 264 M.c.f. per day.

Gulf Oil Corp. apparently has the most significant recent development in the Big Horn basin of Wyoming where a gage of 1,385 bbl. of distillate daily was reported during 10-hour test of the 1 Stockham-Federal C SE NW 2-46n-94w, southwest of the town of Worland. The well flowed gas at the rate of 12,000,000 cu. ft. per day and 577 bbl. of 48°-gravity distillate during the 10-hour test, which was made on 52/64-in. choke. Test followed acidization with 5,000 gal. in the interval 12,905-13,000 ft., in open hole. Tubing pressure was 1,100 psi. Gulf is continuing to test through various size chokes. Gas is sour, but percentage of hydrogen sulfide content has not been announced by the operator.

WYOMING WILDCAT FAILURES

Hot Springs County, Northwest Waugh dome: Ajax Oil Co. 1 Loeb, C NW SE 27-45n-97w, dry, TD 5,982 ft. Tensleep 5,890 ft.

Natrona County, Burke Ranch unit: Carter Oil Co. 1 State-Burke Ranch, SW SE SE 36-37n-79w, dry, TD 8,555 ft. Tensleep 8,376 ft.

Park County, North Garland: Farmers Union Central Exchange 7 Government-Harriman, dry, TD 5,122 ft. Amsden 5,086 ft.

COLORADO SUCCESSFUL WILDCAT

Adams County, Noonan Ranch: Ginther-Warren-Ginther 1 Noonan Ranch, NE SW NW 24-3s-59w, pumped 20 bbl. oil per day, 50 per cent water, TD 6,600 ft. PBTD 6,245 ft. Dakota 6,412 ft., Lakota 6,505 ft., Morrison 6,560 ft.

COLORADO WILDCAT FAILURE

Yuma County: George Livermore 1 I. Green, C SW NE 8-2s-43w, dry, TD 5,609 ft. Reagan 5,480 ft.

WESTERN NEBRASKA WILDCAT FAILURE

Keith County, Northeast Ogallala: Rock Hill Oil Co. 1 Ables, SE SW NE 21-14n-37w, dry, TD 5,020 ft. basal Pennsylvanian 4,850 ft., preCambrian 4,898 ft.

Further evidence of the exploratory program being carried on through Nevada, Utah, and Idaho by Standard Oil Co. of California was seen in the announcement of location for a wildcat test of the Sheep Creek structure in Bear's Lake County, Idaho. The company will drill 1 Unit, SW NW NW 34-15s-45e, on a block where unitization is just being completed. Scheduled as a 5,500- ft. test the well would go 500 ft. below Rex chert (Phosphoria).

More than 60 new locations were announced for the entire Rocky Mountain region last week, continuing the recent high rate of activity and forecasting new records in coming summer months. Wyoming led with 17 locations, principally development wells, Montana had 17, with a scattering of exploratory ventures, and Colorado had 16, nine of which were new wildcat starts in the Denver-Julesburg basin.

Central Area

ILLINOIS

Coy Oil Co. and Bury Drilling Co. have a good two-zone flowing well in their 1 Prout, SE SE SW 12-2n-13w, a wildcat a mile from other production in the area 8 miles southwest of Lawrenceville, Lawrence County, Producing from the McClosky lime with casing perforated at 2,385-91 ft., the well flowed 30 bbl. of oil per hour natural. Testing O'Hara lime, perforated at 2,357-63 ft. with plug between the two zones, it flowed 40 to 48 bbl. per hour. With both zones open, it flowed initially at the rate of 1,200 bbl. per hour. Later, flow was gaged at the rate of 550 bbl. per day. Total depth is 2,438 ft. with casing at 2,430 ft.

Three-fourths of a mile from production in the Centerville area, 8 miles north of Carmi, White County, Q. B. Mitchell recovered 1,600 ft. of clean oil, bottom-hole pressure of 450 psi., in a 2-hour drill-stem in O'Hara lime at 3,311-23 ft. in his 1 Ada Stanley, SW SE NW 1-4s-9e. The well gassed in 10 minutes. Hole has been drilled to 3,414 ft. and casing run through the indicated pay zone to 3,376 ft.

INDIANA

Affeld Oil Co. and associates 1 McCoy, Military Donation 13-2n-9w, a mile from other production in the area a mile southwest of Monroe City, Knox County, swabbed and flowed 210 bbl. of oil in 6 hours in a production test of Rosiclare lime, perforated at 1,553-62 ft. Well has been shut in for additional tankage.

L. F. Wilson and Joe Vail have an indicated discovery well at their 1 Fawcett, NE SW NE 34-6s-12w, eastern Posey County. A 70-minute drill-stem test at 2,728-34 ft. in McClosky lime got gas in 10 minutes and flowed clean oil at the end. Bottom-hole pressure was 850 psi. Casing has been run for completion. Location is a mile from production in the area 7 miles west of Evansville.

A new Waltersburg sand pool is indicated in southwestern Spencer County, where Nash Redwine 1 Sparks, SE SE SW 13-6s-7w, filled 330 ft. of clean oil and 290 ft. of mud-cut oil in a 60-minute drill-stem test at 900-13 ft. The well gassed in 50 minutes. Bottom of the hole at 913 ft. still is in saturation. Casing has been run to 899 ft. Location is 3 miles northeast of Richland and more than 2 miles from other production.

WESTERN KENTUCKY

H. E. Lopp, Thurston Cook and associates 1 Ellis, a wildcat in 9-L-26, 7 miles southwest of Calhoun, southwestern McLean County, got a flow of clean oil in a drill-stem test of saturation found in O'Hara lime at 2,638-44 ft. The well gassed in 5 minutes and oil was at the top in 39 minutes. Bottom still is in saturation. Casing has been run to 2,633 ft. The prospective well is 2 miles from other production.

J. R. Powell and associates 1 Blair, a mile northeast of Sebree, northeastern Webster County, produced at the rate of 5 bbl. of oil natural in swabbing tests of Tar Springs sand at 1,735-45 ft., and is being put on the pump. Located in 11-N-24, it is more than 2 miles from other production. Bottom of the hole at 1,745 ft. still is in saturation. Casing was bottomed at the top of the pay.

EASTERN KENTUCKY

In Big Sandy gas field and in the Pike County sector on Johns Creek, Columbian Fuel Corp. has completed a good well at its 1 Everett Gannon. Gas was found in three zones of the Maxon (Mississippian) sand topped at 2,220 ft. and bottomed at 2,264 ft. On open flow all gas gaged 8,713,000 cu. ft. of gas daily with a rock pressure of 485 lb.

In the same field and sector United Fuel Gas Co. has completed 39 Kentland Coal & Coke Co. for 622,000 cu. ft. gas daily from the Devonian black shale at a depth of 4,711 ft. Well rocked up to 615 lb. in 48 hours.

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MICHIGAN

Success at two important Richfield oil wells in Michigan, one in Hamilton Township, Clare County, being completed by the Sun Oil Co., and the other in Foster Township, Ogemaw County, a major extension of Rose City Richfield pool, completed by Brazos Oil & Gas Co., offered encouragement for an active development program in the state during the balance of 1952. These two new wells appeared to be the most important strikes for Michigan in several years—perhaps the most important since the discovery of shallow Traverse-Dundee Pentwater oil field in Oceana County, in 1948. Some geologists and engineers are beginning to estimate that either or both of these may be the opener of from 15,000,000 to 25,000,000 bbl. of new Michigan oil reserves.

At Sun Oil Co. 1 Iutzi et al, NW SW SW 5-19n-3w, the Clare County deeper zone discovery, production was reported at 225 bbl. of net oil in 8 hours after acid treatment with 5,000 and 2,000 gal. This production test was after all acidizing fluids had been recovered. This well was bottomed out in the Richfield at 5,380 ft., total depth, but was plugged back to 5,213 ft. before being tested. Sun had spudded the 1 Ehole, NW SE SW 5-19n-3w, a Richfield test, and had also spudded the west 160-acre gas location offset, in C SE 6-19n-3w. The 1 Iutzi et al carried a gas pay in the Marshall which was gaged at over 3,000,000 cu. ft. a day on drill-stem test.

The Rose City extension wildcat, Brazos Oil & Gas Co. BBB-5 State-Foster, N½ NW SE 24-24n-1e, Foster Township, Ogemaw County, over 2½ miles north and west of Rose City pool, flowed 226 bbl. of net oil from the Richfield in 24 hours after acid treatment with 2,000 gal. Well was being flowed through a ½-in. choke from the Richfield at 4,294 ft., total depth. Sun had staked location for the north 40-acre offset to the No. BBB-5, while Brazos had staked location for a well to the southeast, the No. BBB-6, N½ SE SE 21-24n-1e.

ILLINOIS WILDCAT FAILURES

Clark County: E. H. Jahn 1 Riley, SW SE NW 25-11n-13w, dry, TD 626 ft.

Clay County: N. V. and W. Duncan 1 Anderson, NW SW SE 32-4n-8e, dry, TD 3,135 ft.

Calvert Drilling, Inc., 1 McPeak heirs, SE SW NW 3-4n-6e, dry, TD 2,923 ft.

Coles County: Carl Drake 1 Drake-Collins, E½ SW NW SW 22-14n-10e, dry, TD 381 ft.

Fayette County: Milton Smith 1 Kuffel, 330 ft. from NL and EL Fractional SW 6-5n-1e, dry, TD 1,638 ft.

J. G. Brown 1 Miller, SE NE SW 10-6n-1w, dry, TD 1,595 ft.

Pure Oil Co. 1 Millhon, NW NE NE 12-8n-1w, dry, TD 1,660 ft.

Jasper County: Aurora Gasoline Co. 1 Birch, NE NW SW 20-5n-8e, dry, TD 2,984 ft.

C. B. Mansfield 1 Crouse, 990 ft. from NL and 350 ft. from WL Fractional Section 31-6n-9e, dry, TD 3,211 ft.

Perry County: W. L. Griffith 1 Hendrickson-Zimmerman, SW NW SW 5-4s-4w, dry, TD 445 ft.

Richland County: Ryan Oil Co. 1 Ritter, SE SW SE 35-3n-10e, dry, TD 3,370 ft.

Washington County: Carter Oil Co. 1 Schrieber, NE SW NW 3-1s-3w, dry, TD 2,705 ft.

Wayne County: H. A. Weinert 1 Burkett, 330 ft. from NL and WL Fractional NE 2-3s-7e, dry, TD 3,490 ft.

White County: George & Wrather 1 Stock, NW SW SW 6-5s-10e, dry, TD 3,301 ft.

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INDIANA WILDCAT FAILURES

Daviess County: M. Chapman 1 Gynes, SE NE NW 13-2n-6w, dry, TD 834 ft.

Sterling Drilling Co. 1 Crane, NE NE SW 27-5n-5w, dry, TD 1,001 ft.

Gibson County: B. M. Heath 1 Emerson, NE NE SE 31-3s-11w, dry, TD 2,158 ft.

(Continued on page 272)

Southwest Texas

Atascosa Wildcat Shows Good Recovery on Test

CORPUS CHRISTI.—M. and S. Rosner recovered 300 ft. of pipe-line oil on a 25-minute drill-stem test at 1 Nellie Dinsmore, wildcat discovery in Atascosa County. Location is in John Bryan Survey, 238, 2½ miles north of McCoy and 2,900 ft. from north line and 330 ft. from east line of 326-acre lease. Previous to running drill-stem test, cores showed a saturated section of Carrizo sand.

Approximately 2½ miles northeast of the Rosner wildcat, Lone Star Gas Co. is continuing to test 1 Juan Lea after testing 62.4 bbl. of 60.1°-gravity oil on an 8-hour test from perforations 8,142-52 ft. in the Edwards lime. Gas-liquid ratio was reported to be 16,500-1 and flowing pressure was 2,510 psi. with no water present.

Appell Drilling Co. and Dorrance have completed 3 J. L. Dornak as a new sand discovery from perforations at 396-401 ft. for 20 bbl. of oil daily with 30 per cent water. Gravity was reported to be 19° and top of pay was reported to be at 396 ft. Well was previously reported as a shut-in gas well from perforations 443-49 ft., where flow rate was reported to be 280,000 cu. ft. of gas per day. Well was drilled to a depth of 1,449 ft. with 7-in. casing cemented to 845 ft. Location is in John Gaston Survey, 6 miles southwest of Jourdanton.

Kirkwood & Morgan tested 6-shot perforations in Luling sand zone of the Wilcox at 1 W. A. Bell, wildcat discovery in DeWitt County, F. R. McConnell Survey 2, A-440, 3 miles northeast of Thomaston. Test on perforations 7,959-60 ft. flowed oil through a ¼-in. choke at an estimated rate of 150 bbl. per day and flowing pressure built up to 1,350 psi. in 12 hours. A 2,700 ft. water cushion was used and it came to the surface in 30 minutes. Previous tests in the Yegua at 5,067-78 ft. indicated production at that level. It has been reported the operators plan to drill a Yegua sand test in that area.

Charles A. Daubert and Walter Achning continued testing the 1 F. B. Frels, San Patricio County wildcat, after well flowed 100 bbl. of oil per day through ¼-in. choke from perforations at 4,708-11 ft. The well was bottomed at 4,848 ft. with 5½-in. production string cemented to 4,770 ft. Location is 2 miles northwest of Mathis and is 3,600 ft. from 1-A Soehnge, gas discovery, producing from a 4,024-28 ft. zone.

A possible new Willacy County gas and distillate discovery was being watched at The Texas Co.'s 7 Yturrio Land & Cattle Co. in Share 4, "San Juan de Carricitos" Jose Narciso Cabazos Grant, A-8. The wildcat was drilled to a total depth of 10,514 ft. with 7-in. production string cemented to total depth. Test from 9,903-15 ft. with ¼-in. choke and 3,540 ft. of water cushion, developed 35 psi. working pressure in 10 minutes, then built up to 60 psi. after tool was closed, dropping to 0 psi. in 1 minute. Recovery was 210 ft. of gas and distillate cut mud, 4 per cent distillate. Bottom-hole pressure was recorded from 4,700 to 5,850 ft.

Taylor Refining Co.-Mayfair Minerals, Inc., is testing gas and distillate at 1 Blanche Bales, wildcat 1½ miles south of McAllen in Hidalgo County, after perforating a 25-ft. section in a 10,660-ft. zone. Exact perforations were not available. Bottomed at 11,501 ft. with 5½-in. production string set at 10,492 ft., the well was plugged back to 10,501 ft.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) WILDCAT FAILURES

Atascosa County: Calver, Cochran & Manley 1 Mills & Brite, Sec. 5, J. Poitevent Survey, dry, TD 2,117 ft.

E. A. Kinsel 1 Kinsel fee, William Johnson Survey, 228, dry, TD 2,905 ft.

Texas-Wisconsin Oil Co. 1 R. W. Hamilton, Lucius Gates Survey, A-320, dry, TD 3,204 ft.

Duval County: Will E. Odom, Trustee, 1 Denman, J. Marcelo Ynojosa Survey, A-628, dry, D 5,770 ft.

Frio County: Kirkwood & Morgan, Inc., 1 H. A. Brundrett, John Casanova Survey 329, A-157, dry, TD 5,628 ft.

Jim Hogg County: Sun Oil Co. 1 Alice J. Eshleman et al, Palo Blanco Antonio Pean Survey, A-247, dry, TD 6,353 ft.

Jim Wells County: Bridwell Oil Co. 2-A Gertrude H. Hoffhines, William Parks Survey 29, dry, TD 4,023 ft.

Kenedy County: Humble Oil & Refining Co. 6 Sauz Ranch, Ternerias San Juan de Carricitos Survey, dry, TD 8,982 ft.

LaSalle County Pontiac Refining Corp. 1 Elbert Martin, Sec. 3, O.Wof Survey, A-699, dry, TD 5,472 ft.

(Continued on page 272)

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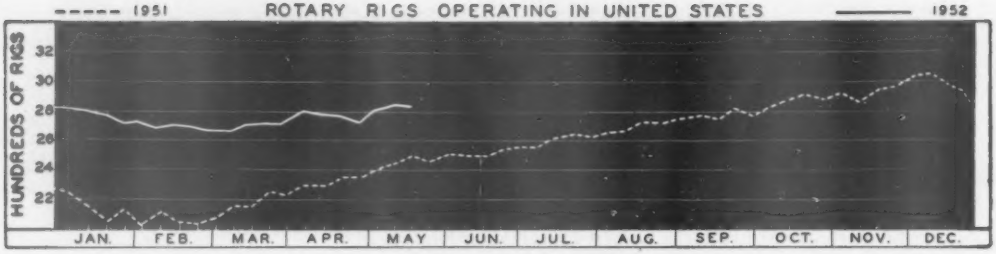
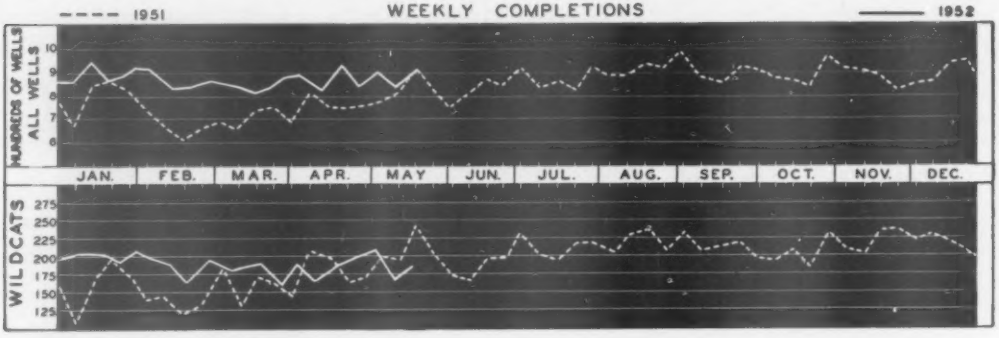




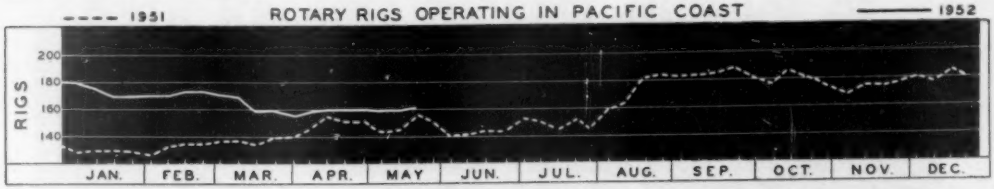
CURRENT STATISTICS

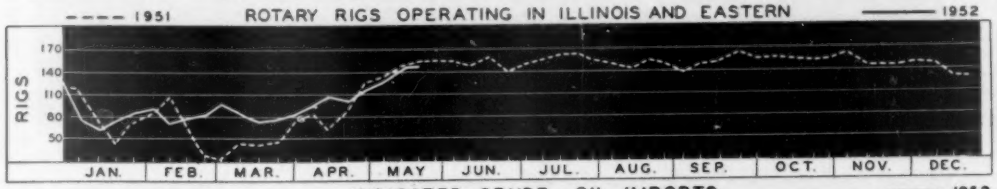
EXPLORATION

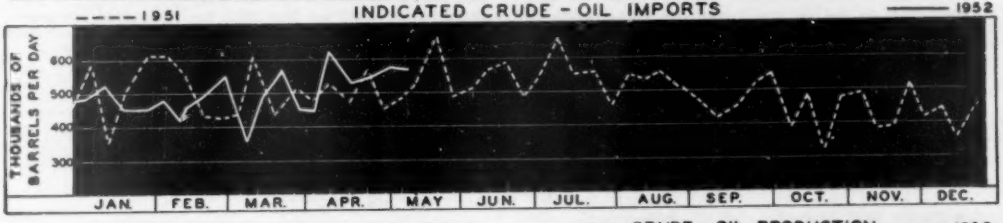
WEEKLY WELL COMPLETIONS . . . WEEK ENDED MAY 17, 1952

	Total of all wells					May 17		Wildcat completions and discoveries					Cumulative total, 1952				
	Comp.	Oil	Gas	Dry	Footage	1952	1951	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	19	10	0	*9	23,450	246	99	0	0	0	0	0	0	0	0	0	0
Pennsylvania	32	14	5	†13	64,000	630	273	0	0	0	0	0	0	0	0	2	2
West Virginia	7	0	5	2	23,237	247	210	0	0	0	0	0	0	0	2	1	3
Ohio	30	8	13	‡9	58,298	348	295	0	0	0	1	1	0	0	5	4	9
Indiana	26	9	1	16	44,845	404	362	0	0	0	9	9	14	0	2	121	137
Kentucky	29	9	6	14	62,875	467	342	0	0	0	6	6	9	0	0	80	89
Illinois	38	11	0	27	91,485	553	641	0	0	0	14	14	7	0	0	146	153
Michigan	10	3	0	7	20,295	253	245	1	0	0	2	3	11	0	1	89	101
Kansas	95	49	7	39	318,483	1,817	1,553	4	0	0	13	17	36	0	5	299	340
Nebraska	4	1	2	1	18,308	92	107	0	0	0	1	1	4	0	0	49	53
Oklahoma	101	55	6	¶40	396,963	2,297	2,080	2	0	0	9	11	40	1	7	238	286
Texas	356	212	14	130	1,768,071	6,809	6,139	17	2	3	67	89	314	29	51	1,415	1,809
North Central (Dist. 7-B & 9)	121	62	4	§55	371,618	2,091	1,858	11	0	3	26	40	181	1	17	598	797
West (Dist. 7-C & 8)	103	81	1	21	665,449	2,102	1,893	5	0	0	11	16	57	0	3	242	302
Panhandle (Dist. 10)	11	8	3	0	32,132	267	262	0	0	0	0	0	1	0	3	20	24
Eastern (Dist. 5 & 6)	20	14	1	¶5	110,143	360	438	0	0	0	2	2	12	3	0	80	95
Gulf Coast (Dist. 2 & 3)	58	31	4	23	388,783	1,029	857	1	2	0	11	14	39	17	12	202	270
Southwest (Dist. 1 & 4)	43	16	1	26	199,946	960	831	0	0	0	17	17	24	8	16	273	321
Louisiana	46	24	8	14	374,307	841	732	3	1	1	3	8	17	8	5	91	121
Northern	20	8	3	9	83,096	447	359	1	0	1	1	3	7	0	5	38	50
Southern	26	16	5	5	291,211	394	373	2	1	0	2	5	10	8	0	53	71
Arkansas	6	4	0	2	17,142	142	136	0	0	0	1	1	4	0	0	22	26
Mississippi	5	2	0	3	36,012	143	106	1	0	0	2	3	8	1	1	54	64
Southeastern States	2	0	0	2	8,663	20	32	0	0	0	1	1	1	0	1	11	13
Montana	4	2	0	2	9,778	83	78	0	0	0	0	0	2	0	1	20	23
Wyoming	13	7	0	6	69,242	242	248	0	0	0	3	3	11	0	2	38	51
Colorado-Utah	6	2	0	4	37,094	189	92	1	0	0	1	2	11	0	5	62	78
New Mexico	22	12	5	5	102,810	366	250	1	0	0	3	4	15	0	1	38	54
California	54	46	1	7	192,904	974	769	0	0	0	6	6	38	0	1	178	217
North Dakota	1	1	0	0	8,690	12	2	0	0	0	0	0	2	0	0	4	6
Miscellaneous (Md.)	2	0	1	1	7,134	27	14	0	0	1	1	2	0	0	8	11	19
Total United States	908	481	74	353	3,754,086	17,202	14,805	30	3	5	143	181	544	39	98	2,973	3,654
Total previous week	838	446	62	330	3,410,655			29	1	3	136	169	514	36	93	2,830	3,473
Total May 19, 1951	919	470	59	390	3,748,957			37	3	7	195	242	516	30	100	2,695	3,341

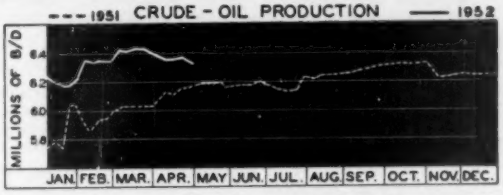
Service wells included: *9, †11, ‡2, §3, ¶1.

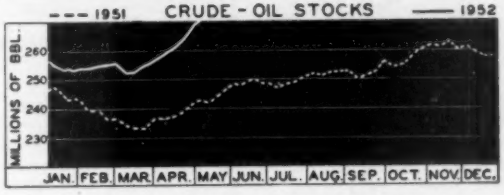






Owing to conditions brought about by the present labor strike affecting part of the oil industry, The Oil and Gas Journal is unable to make available the weekly estimate of crude-oil production in the United States for the week ended May 17, 1952.



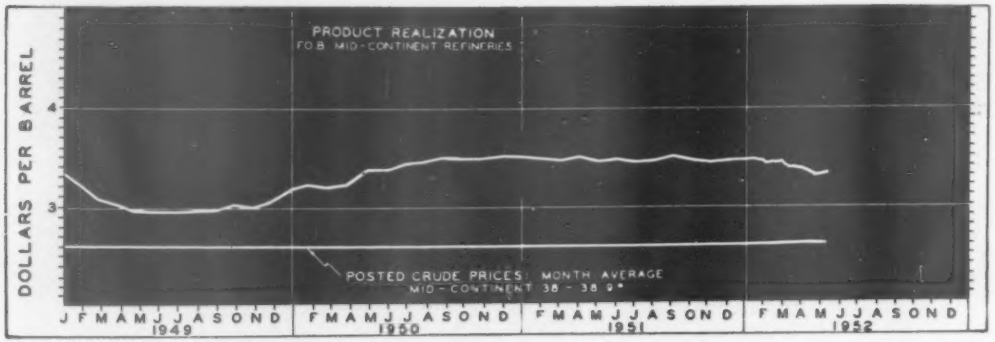


CRUDE-OIL STOCKS BY STATES OF ORIGIN*

(Thousands of barrels)

	May 10, '52	May 3, '52	May 12, '51
Pennsylvania Grade	2,461	2,442	2,074
Other Appalachian	1,999	2,140	1,473
Illinois, Indiana, Michigan	12,566	12,316	10,684
Arkansas	3,223	3,065	2,538
Louisiana	15,114	14,616	14,179
North	2,924	2,890	2,791
Gulf	12,190	11,726	11,388
Mississippi	3,599	3,695	3,121
New Mexico	7,414	7,490	6,833
Oklahoma and Kansas	42,858	42,867	37,849
Texas	134,117	128,023	112,191
East Texas proper	12,774	12,177	(†)
West Texas	59,481	56,724	(†)
Texas Gulf	29,863	27,796	(†)
Other Texas	31,999	31,326	(†)
Rocky Mountain	15,726	15,024	14,133
California	30,199	30,473	30,175
Foreign	7,621	7,464	7,219
Total	276,897	269,615	242,469

*Bureau of Mines. †Not comparable with current week.


PRODUCT REALIZATION
F.O.B. MID-CONTINENT REFINERIES
DOLLARS PER BARREL
4
3
POSTED CRUDE PRICES: MONTH AVERAGE
MID-CONTINENT 38 - 38.9°
J F M A M J J A S O N D
1949
F M A M J J A S O N D
1950
F M A M J J A S O N D
1951
F M A M J J A S O N D
1952

In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields for current week are estimated. Realization averaged $3.33 for week ended May 10, $3.31 for previous week, and $3.47 for May 1951. The above trend information is based on volumes and current prices and therefore does not reflect changes in operating costs.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of May 21, 1952. Figures are f.o.b. plant for tank-car shipments in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Texas Gulf Coast
Regular gasoline, 80-82 octane	10⅜-10½	12-12.75	10¾-11
Premium gasoline, 86-88 octane	11⅜-11½	13.5-13.75	11¾-12
42-44 w.w. kerosine	8¾-9	10-10.1	9
No. 2 straw fuel oil	7¾-8	9-9.25	8
No. 6 residual	$1.30-1.40	$2.45-2.60	$1.75-1.90

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	5½	5	5¼
Grade 18-55	6.6	6.1	6.35

LUBRICATING OILS

South Texas

200 vis., No. 2-3 neutral	13-13.5
750 vis., No. 3-4 neutral	16
2,000 No. 5-6 neutral	18-19

LUBRICATING OILS

Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	29
200 vis., No. 3 neutral, 0-10 pp.	16.5

Western Pennsylvania

145-155 vis., 10 p.t. bright stock	32.5
180 vis., 0 p.t. neutral	31.5

WAX

Mid-Continent

132-134 A.M.P.	5.5

MOVEMENT of gasoline has increased with the return of workers at some of the plants that had been closed by strikes, but the increase is only enough to prevent widespread shortages. If the strike had lasted another week, many service stations would have been out of gasoline. At the end of the third week of the strike, shortages were beginning to show up at the primary level. Most of the surplus gasoline in storage on the pipe lines of District 2 had been used up and inventories at operating refineries are down to working stocks.

Gasoline markets in the inland areas were slightly soft through most of April, and gasoline was freely available on the Gulf Coast. Gasoline price wars at the service-station level on the East Coast indicated a highly competitive market in that district. Gasoline markets normally improve with the increased consumption that comes in the early summer months. Since decreased production during the strike period reduced gasoline inventories and boosted prices back to ceiling levels, the chances now are good for firm markets until demand drops off in the fourth quarter.

Refineries will need firm product markets to cover increased operating costs under new labor contracts. Refinery realization in the Mid-Continent area decreased gradually in the first 4 months of the year. At the end of April realization was about 20 cents a barrel less than at the same time last year.

The effect of the strike on fuel markets was to prevent further softening rather than to bring better prices. However, the loss of production in the 3-week period will require higher refinery runs for the next 10 months to meet fuel demands during the winter. The reduction in surplus stocks may help summer sales for building consumer inventories.

CRUDE PRICES

GRAVITY SCHEDULE

	Signal Hill, Calif.‡	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.93			
19-19.9	1.98			
20-20.9	2.03	$2.25		$2.12
21-21.9	2.07	2.27		2.14
22-22.9	2.12	2.29		2.16
23-23.9	2.18	2.31		2.18
24-24.9	2.24	2.33	$2.56	2.20
25-25.9	2.30	2.35	2.58	2.22
26-26.9	2.36	2.37	2.60	2.24
27-27.9	2.41	2.39	2.62	2.26
28-28.9	2.46	2.41	2.64	2.28
29-29.9	2.52	2.43	2.66	2.30
30-30.9	2.57	2.45	2.68	2.32
31-31.9	2.62	2.47	2.70	2.34
32-32.9	2.68	2.49	2.72	2.36
33-33.9		2.51	2.74	2.38
34-34.9		2.53	2.76	2.40
35-35.9		2.55	2.78	2.42
36-36.9		2.57	2.80	2.44
37-37.9		2.59	2.82	2.46
38-38.9		2.61	2.84	2.48
39-39.9		2.63	2.86	2.50
40 and above		2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947.

‡Standard Oil Co. of California.

FLAT CRUDE PRICES

Representative posted schedules per barrel.	
Kettleman Hills, California*	$2.80
Louisiana:	
Beauregard Parish	2.60
Cotton Valley (distillate)	2.85
Cotton Valley (crude)	2.70
Texas:	
East Texas	2.65
Pecos County (Yates)	2.35
Conroe	2.83
Van	2.48
Pennsylvania Grade:	
Bradford	4.25
Southwest Pennsylvania	3.82
West Virginia	3.76
Illinois Basin	2.77

*37°-37.9°.

April Records Highest Number of Well Completions Since January

by John C. McCaslin

TOTAL completions in the United States totaled 3,821 in April, up 0.5 per cent over March, the highest number of completions since January. April's total is a 17 per cent increase over April last year. Successful oil and gas completions were down from March, compensated by an increase in dry holes drilled which were up 88.

April vs. March

Southwest . . . Completions in Texas and New Mexico totaled 1,771, up 339 for the greatest gain in all United States' areas. The seventh deepest producer in the United States and the deepest producer for the Permian basin was completed at Buffalo Oil Co.'s Devonian discovery in shallow Maljamar field, Lea County, New Mexico, from open-hole pay at 13,554-73 ft.

Rocky Mountains . . . Completions in the Rocky Mountain province totaled 99, down 30.

California . . . Total completions for the West Coast were up nine. Developments in the Castaic area, California's current hot spot, continued at a high pace.

Mid-Continent-North Central . . . Completions in Kansas and Oklahoma totaled 764, down 23 per cent. The total number of completions in the North Central area from Kentucky to Michigan was 476, up 5.

Dakotas . . . North Dakota chalked up one oil completion in Williams County for the only successful completion in the two-state area. McKenzie County, North Dakota, became the second indicated producing county in the state with the discovery of oil at Amerada Petroleum Corp. I Risser.

Southern . . . Completions in the southern and southeastern states totaled 215, down 38. An important Lower Cretaceous strike in Wayne County, Mississippi was completed to open Hiwannee pool.

SUMMARY OF COMPLETIONS, APRIL 1952

	Total comp.	Oil	Gas	Dry	Under 2,500 ft.	2,500-5,000 ft.	5,000-7,500 ft.	7,500-10,000 ft.	10,000-12,500 ft.	Over 12,500 ft.	Total footage	Rigs and drilling
New York	77	39	0	38	77	0	0	0	0	0	93,800	75
Pennsylvania	126	56	9	61	117	9	0	0	0	0	256,254	150
West Virginia	48	2	39	7	15	30	3	0	0	0	154,935	215
Maryland	5	0	1	4	0	4	1	0	0	0	22,747	24
Ohio	108	41	14	53	60	47	1	0	0	0	211,138	152
Kentucky	98	30	23	45	62	36	0	0	0	0	196,722	181
Illinois	127	44	1	82	56	71	0	0	0	0	302,515	220
Indiana	80	32	0	48	67	13	0	0	0	0	145,406	145
Michigan	63	19	3	41	33	30	0	0	0	0	165,801	117
Kansas	337	143	26	168	43	289	5	0	0	0	1,129,206	484
Nebraska	16	4	1	11	0	9	6	1	0	0	82,224	28
Oklahoma	427	233	15	179	124	199	67	28	9	0	1,626,057	836
Texas	1,683	1,034	60	589	353	563	503	217	38	9	8,161,948	1,560
N. Central (Dist. 7-B & 9)	552	267	7	278	216	246	89	1	0	0	1,785,695	310
West (Dist. 7-C & 8)	545	450	2	93	44	118	275	88	16	4	3,264,923	566
Panhandle (Dist. 10)	59	30	20	9	8	47	2	1	1	0	191,497	85
East (Dist. 5 & 6)	105	66	4	35	3	45	28	26	2	1	614,898	101
Gulf Coast (Dist. 2 & 3)	212	112	13	87	15	48	61	72	12	4	1,385,977	294
Southwest (Dist. 1 & 4)	210	109	14	87	67	59	48	29	7	0	918,958	204
Louisiana	157	91	8	58	42	22	18	28	30	17	1,080,532	272
North	81	47	5	29	42	20	11	6	2	0	285,467	97
South	76	44	3	29	0	2	7	22	28	17	795,065	175
Arkansas	31	18	0	13	6	20	4	1	0	0	108,017	36
Mississippi	25	9	0	16	0	1	21	0	1	2	176,760	22
Ala., Ga., Fla.	2	0	0	2	0	1	1	0	0	0	8,295	8
Montana	12	6	0	6	7	3	0	2	0	0	38,318	60
Wyoming	47	32	1	14	7	18	17	4	0	1	228,431	140
Colorado	31	15	4	12	2	4	24	1	0	0	164,182	51
Utah	9	2	0	7	1	0	3	3	2	0	67,631	31
New Mexico	88	48	24	16	13	31	16	16	10	2	494,837	220
California	216	164	6	46	68	84	45	12	6	1	881,525	279
North Dakota	2	1	0	1	0	0	0	2	0	0	18,301	15
Miscellaneous	§6	0	0	6	4	1	0	1	0	0	17,192	¶16
Total April 1952	3,821	†2,063	235	*1,523	1,157	1,485	735	316	96	32	15,832,774	‡5,337
Total March 1952	3,799	2,101	263	1,435	1,143	1,598	651	275	107	25	15,470,971	5,448
Total April 1951	3,277	1,775	169	1,333	1,132	1,342	534	171	82	16	12,374,590	5,275
Cumulative 1952	15,221	8,244	1,035	5,942	4,527	6,132	2,877	1,129	452	104	63,065,051	....
Cumulative 1951	13,085	7,178	864	5,043	4,241	5,528	2,161	746	353	56	50,754,885	....
Alberta, Canada:												
April 1952	116	69	16	31	16	44	54	2	0	0	544,895	....
March 1952	127	68	10	49	19	49	56	2	1	0	555,566	....
Cumulative 1952	462	274	40	148	68	164	219	9	2	0	2,076,709	....

*Incl. 119 service wells: N. Y. 38, Pa. 49, Ohio 9, Mich. 9, Kans. 3, Okla. 5, N. Cent. Tex. 4, E. Tex. 1, Tex. Gulf Coast 1. †Incl. 38 condensate wells: W. Tex. 10, Tex. Gulf Coast 12, S.W. Tex. 8, S. La. 2, Miss. 1. ‡Incl. all wells rigged up and/or drilling at month end. §Incl. Tenn. 2, 1,681 ft., S. D. 3, 14,553 ft., Mo. 1, 958 ft. ¶Incl. S. D. 1, Mo. 3, Tenn. 9, Idaho, Ariz., Nev. 3.

EQUIPMENT MEN . . . in the News

Western Co. Announces Four Appointments

C. L. Glass, vice president and secretary-treasurer of The Western Co., has announced the appointment of R. E. Cox as assistant vice president and assistant secretary of the company. Glass also announced the addition of J. J. Lienhard to the administrative staff of the company's general staff in Midland, Tex., and Paul J. Nicholson has been named to fill the newly created position of general office manager. The company also announces the appointment of C. V. Helm as special assistant to Walter Beadle, vice president of operations of Western at Midland.

R. E. COX

J. J. LIENHARD

P. J. NICHOLSON

C. V. HELM

Cox, in his new capacity, will be in charge of budgeting and special financial projects and reports. He has been with the company for more than 5 years and has served as comptroller and assistant secretary. Before joining Western he was affiliated with Allis-Chalmers.

Lienhard, as comptroller, will be responsible for all accounting and accounting procedures. He previously was with Standard Oil Co. of New Jersey for 12 years.

Nicholson will handle insurance matters, and other assignments as well as management of the general office. He served as field engineer with the Portland Cement Association in Oklahoma City before starting with Western.

In his new position Helm will work on various operational projects and assist Western's employe-relations department in the procurement, placement, and training of new employes. Helm has been with Western 4 years, and before being transferred to Midland for the staff assignment, he was manager of the company's acidizing station at Ulysses, Kans. He is succeeded at Ulysses by Harold Parsons, who formerly was district engineer for Western's South Permian basin district with headquarters in Odessa.

New York Belting Names Colgin to New Sales Post

Appointment of Andrew G. (Tag) Colgin as sales representative in the East Texas and Mississippi oil fields for New York Belting & Packing Co. was recently announced by W. A. Lindfors, sales manager.

Colgin will make his headquarters in Shreveport, and will handle the company's line of conveyor and elevator belting, oil-field specialties, hose, molded goods, and other industrial rubber products.

General Electric Adds Bunday To Electronics Division

Dale L. Bunday has joined the General Electric Electronics Division as a district sales manager for communication equipment, according to an announcement by L. W. Goostree, Jr., communication equipment sales manager. Bunday will be responsible for sale of G-E communication equipment in Oklahoma, Arkansas, New Mexico, and the Panhandle section of Texas. His headquarters will be at Oklahoma City.

D. L. BUNDAY

Bunday has held supervisory engineering positions in a number of electronics manufacturing firms, including General Electric. He was radio supervisor for the city of Fort Worth prior to accepting this new position.

United Supply Occupies New Tulsa Headquarters

United Supply & Manufacturing Co. is now in its new headquarters office building at 911 South Main in Tulsa. The modern one-story structure covers a 50 by 140-ft. lot.

The new building is another big stride for United, which was founded in 1936 by H. Brooks Gutelius, Sr., company president. Since its formation United has completely stocked supply houses in Elk City, Oklahoma City, Pauls Valley, Ringwood, Seminole, and Velma, Okla.; Hutchinson, and Pratt, Kans.; Eunice, and Lovington, N. M.; Eunice, Homer, and New Iberia, La., and Alice, Denver City, Edna, Houston, Kermit, Odessa, Snyder, and Sundown, Tex.

District offices are located at Tulsa, Oklahoma City, and Ardmore, Okla.; Hobbs, N. M.; Shreveport, La.; Dallas, Houston, and Midland, Tex.

The company also has a factory in Tulsa where United pumping units and gear boxes are manufactured and assembled.

Other officials in the company are H. Brooks Gutelius, Jr., Frank Wood, and F. W. Fisher, vice presidents, and E. F. Geary, comptroller.

Wells Is New Sales Agent For Web Wilson Oil Tools

A. P. WELLS

A. P. (Joe) Wells has recently become associated with J. M. Defee, representing Web Wilson Oil Tools, Inc., in West Texas and eastern New Mexico. The new combination will be known as Defee & Wells, Odessa, Tex.

Wells was previously connected with Oil Well Supply Co. in Illinois and the Rocky Mountains, and more recently with American Iron & Machine Co. in West Texas and Louisiana.

Calumet and Hecla Advances Dumser, Howland

J. M. DUMSER

J. P. HOWLAND

H. Y. Bassett, vice president and general manager of Wolverine Tube Division of Calumet & Hecla Consolidated Copper Co., has announced the appointment of John M. Dumser as director of sales, replacing George D. Potter. John P. Howland has been appointed sales representative for the company in the Dallas area.

Dumser joined Wolverine October 15, 1951, as general sales manager. Previously he has had many years' experience in the field of sales of copper and brass fabricated products. In his new position Dumser will direct the sales program for the entire Wolverine Tube Division.

Howland formerly served in various sales capacities at Wolverine Decatur Mill. His headquarters will be in Dallas.

Potter has resigned as director of sales to devote his full time to the operation and sales program of Corey Steel Co. of Chicago, of which he is vice president.

O. B. Wilson Is Made Field Sales Manager

O. B. Wilson has been made field sales manager for the Industrial Division of Minneapolis-Honeywell Regulator Co., it was announced recently by L. Morton Morley, vice president of Honeywell and its Brown Instruments division.

Wilson succeeds William H. Steinkamp who was recently made general sales manager of the division. Wilson joined the Brown division in 1923. He later became industrial manager in Chicago, New York, and other offices. He was made industrial manager for the eastern sales region in 1948 when he transferred from the New York branch to the company's headquarters.

Smith to Manage Bethlehem Store at Midland, Tex.

B. K. SMITH

Bethlehem Supply Co. has named B. K. Smith store manager for its new Midland, Tex., store. Smith was formerly store manager at Snyder, Tex. He has had considerable experience in supply store operation in a very active area.

The Midland store will be under the supervision of W. A. LaRew, district manager of the West Texas and New Mexico district.

Totco Completes Series of Mid-Continent Meetings

McCONNELL

H. H. (Pete) Peters, vice president, and E. G. McConnell, Mid-Continent manager, of Technical Oil Tool Corp., have announced the recent completion of the firm's annual series of sales and service meetings in the Mid-Continent area. McConnell stated that meetings were held successively in Houston, Odessa, and Oklahoma City, with Totco service representatives from the surrounding areas in attendance. Over 28 men, including two representatives from Wyoming, were present.

According to McConnell, the theme of this year's series of meetings was to increase the effectiveness of Totco service in the field.

McConnell also reported that Peters, who recently addressed the annual sales meeting of Continental Supply Co. in Dallas, brought a message of continued high production and improved service procedures from the home office to the men in the field.

Beach Made Comptroller for Hinderliter Tool at Tulsa

A. H. BEACH

H. K. Porter Co., Inc., Pittsburgh, has announced the appointment of Albert H. Beach, assistant to the treasurer, as comptroller of its Hinderliter Tool Co. Division located in Tulsa.

Beach comes to Tulsa from Pittsburgh, where he has been associated with Robert Morris School of Business Administration in the capacity of instructor of industrial management, cost, and budgetary control.

A graduate of New York University, School of Commerce and Finance, Beach has been professionally engaged for some years as a management consultant with headquarters in New York City, Philadelphia, and Chicago.

Winslow Engineering Opens New Kentucky Factory

Winslow Engineering Co., Oakland, Calif., has announced the opening of a new factory for the manufacture of Winslow filters and elements in Murray, Ky. The announcement, made by President Charles A. Winslow, disclosed that the new plant is expected to get into production within the next few weeks and will be operated independently under the name of Winslow Engineering, Inc.

L. L. MOORE

D. R. ROBINSON

At an appreciation banquet attended by Murray business leaders, Winslow was welcomed to the Kentucky city by Mayor George Hart. Laurence L. Moore, Winslow's vice president in charge of manufacturing, was commissioned a Kentucky Colonel by State Senator James Lassiter in behalf of Gov. Lawrence Wetherby.

Manager of the new plant is Joseph L. Kern, formerly office manager at Winslow's Oakland headquarters. Kern, who has been with the filter manufacturer for the past 9 years, has been

joined in his eastern move by Donald R. Robinson, who was named production manager. Robinson joined the Winslow organization in 1941.

The eastern assignments given to Kern and Robinson resulted in appointments of two other men to new positions at the Winslow plant in Oakland. Martin J. Duffy has been named office manager. He has been with Winslow 6 years. Jewell S. (Duke) Welch, who joined Winslow in 1950, has been appointed personnel manager.

Macco Corp. Names Metzger To Construction Staff

Stanley A. Metzger has joined Macco Corp. staff as manager of its refinery - construction work. Metzger has been actively engaged in refinery construction for the past 22 years. Among these assignments were plants in Palestine and France, as well as numerous assignments covering various plants throughout the United States. His experience will round out that part of the Macco organization which has been engaged in refinery construction and maintenance work for several years.

Burks Joins Oil Base As Service Engineer

B. H. BURKS

Thad Randolph, vice president in charge of sales for Oil Base, Inc., has announced the addition of Bennett H. Burks as a service engineer for sales and service of Black Magic and other oil-base muds and additives manufactured by Oil Base, Compton, Calif. Burks will be permanently stationed at Odessa, Tex., under the direction of (Pete) Petross who is supervising Oil Base activities in West Texas. A new premix plant has been established at Odessa from which point ready-mixed oil base muds are being delivered directly to well sites.

Burks roughnecked in the Los Angeles Harhor area before joining Oil Base. He has completed an intensive training period in the plant, laboratory, and in the field to acquaint him with company mud products, mud guns, and mud-testing equipment.

Hunt Tool Adds Tarter To Engineering Staff

Ralph Tarter, one of the outstanding experts in the field of setting up, repair, and servicing of drilling rigs, recently joined Hunt Tool Co. as service engineer He will be responsible for inspecting drilling equipment, consultant on repairs or changes to be made to such equipment, and will supervise such work as done in various Hunt Tool shops.

Prior to joining Hunt Tool, Tarter was employed by National Supply Co. for 13 years as service engineer, where he was in charge of setting up, repair, and servicing drilling rigs.

E. L. Lindsey Appointed Los Angeles Branch Manager

E. L. LINDSEY

E. L. (Ed) Lindsey has been appointed Los Angeles branch manager for the Pump Division, Byron Jackson Co., according to an announcement by Lynn Sawyer, vice president and general manager of the division. Lindsey graduated from University of Oklahoma in 1942, and took an additional 2-year course at Spartan School of Aeronautics at Tulsa. He became affiliated with Byron Jackson Co. in 1944, locating in the Houston office of the company as sales engineer.

Morgan Named General Sales Manager of Oil Well Mfg.

O. W. MORGAN

Clarence White, president of Oil Well Manufacturing Corp., has announced the appointment of O. W. (Ox) Morgan as general sales manager for Red Devil products.

Morgan is well known in the domestic and foreign oil fields. Upon completing his shop training course, Morgan's first assignments will be to visit the fields with all sales personnel and to develop sales representation for Rocky Mountain, Canadian, and Mid-Continent territories. He will be assisted by Carroll Baker at the home office and by salesmen and representatives with warehouse stocks at Bakersfield, Calif., Houston, Houma, La., and Odessa, Tex.

Baseheart Is Named General Sales Manager of Buda Co.

J. C. BASEHEART

L. F. Shoemaker, vice president of The Buda Co., Harvey, Ill., recently announced the appointment of J. C. Baseheart as general sales manager of The Buda Co.'s engine division. Baseheart, who is now headquartering at Harvey, is responsible for all wholesale and retail sales of Buda engines and generators.

Basehart, associated with Buda for 26 years, was transferred to the Harvey office in 1951 as sales manager after serving 11 years as president of Buda Engine & Equipment Co., Dallas. Previous to this, Baseheart was transferred to the oil-field division of The Buda Co. in 1929 and appointed manager of this division in 1935.

Since joining The Buda Co. in 1926, Baseheart has worked in various departments of the company, including the service department as a service engineer in the eastern territory.

Watts Named to Business Papers Committee by AAAA

DON WATTS

Don Watts, president, Watts, Payne-Advertising, Inc., Tulsa, has recently been appointed as a member of the Standing Committee on Business Papers by the American Association of Advertising Agencies.

The appointment was made by John P. Cunningham, chairman of the board of A.A.A.A. and vice president of Cunningham & Walsh, a New York City advertising agency.

Watts has been prominent in industrial advertising for many years and the agency of which he is president is the only members of A.A.A.A. in the Tulsa area.

Your MARKET PLACE FOR THE OIL AND GAS INDUSTRY...

CLASSIFIED ADVERTISING

UNDISPLAYED CLASSIFIED 15c a word one issue. 10% Discount three or more consecutive issues. $3.00 minimum charge. Blind Box in our care nine words. Payable in Advance.

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$12.00 a column inch one issue . . .
10% Discount three or more issues.

Address Classified Advertising Material: The Oil and Gas Journal, P. O. Box 1260, Tulsa 1, Okla.

EQUIPMENT FOR SALE

LIKE NEW D-13000 Caterpillar. Twin Disc Clutch and Sheave. 5951 actual hours. Price $3500. C. Spitzfaden, Box 2001, Wichita, Kansas, LD 128.

FOR SALE: Two 28-L Bucyrus Spudders, tools 15½" down to 2½" with complete combination rotary to run off of either rig. One tandem truck, one light truck, 10¾ and 8⅝" casing. Further details, write or call L. & L. Drilling Company, Phone 69, Box 67, Cross Plains, Texas.

USED well drilling equipment. We buy and sell spudders, rotaries, core drills, tools, pipe, blocks, pump jacks, everything for well drilling and service. All used equipment fully reconditioned. Contact us for your requirements and save money. We rent fishing tools. Pressey & Son, Pueblo, Colo.

FOR SALE: One Ready-Power Engine Generator, complete with control cabinet with automatic or manual regulator switch. Specifications are KVA 28.75, KW 23, Volt 120-208, Amp. 64, Phase 3, Wire 4, RPM 1200, Cycle 60, will run on either gasoline or on natural gas, 60 Horse Power International U-9 Engine. This has been used as a standby source of electric power but it is in good condition. It may be inspected at our plant located eight miles South of Ulysses, Kansas, on Highway 270. Price, $1,500. Address inquiries to Hugoton Production Company, Garden City, Kansas.

19 KW. GENERATOR

New Onan Model 10EL-4R/A Generating Set, 4 cylinder gasoline engine, steel housed, four wire, 3 phase, 60 cycle, 120/208 volts.

DENNY & CLARK
1923 W. North Avenue
Chicago 22, Ill.

PIPE FOR SALE

3,500' 5½ O.D. 14# No. 1 Used Seamless Casing 8RD. R2.

FRANK MORRIS & CO.
424 So. Cheyenne, Phone 2-6247
Tulsa, Oklahoma

FOR SALE

7—CLARK GAS ENGINE GAS COMPRESSORS

1—230 H.P.—17x18x26x20
1—230 H.P.—17x18x24x20
1—230 H.P.—17x18x24x20
1—200 H.P.—16x7½x10x20
1—165 H.P.—17x6½x16x20
1—80 H.P.—16x8½x20
1—80 H.P.—16x7½x20

Complete and in good operating condition. Located at Benton, Illinois.

BROWN-STRAUSS CORPORATION
P.O. 78, Kansas City 10, Missouri

Norman Strauss, Phone HArrison 1000 Salesmen on premises, contact R. V. Crisp, Phone 1419 or 610, Benton, Illinois.

EQUIPMENT FOR SALE

7500' OF API Full Hole 4½" Drill Pipe. Graded and tested by Sonoscope engineers. Milford Giffin, Giffin Hotel, Tel. 477, Hoisington, Kansas.

FOR SALE: 10¾", 32#, 8⅝" 24#, and 7" 26# good casing located in Central Pennsylvania. Write Box E-775, The Oil and Gas Journal, Tulsa, Oklahoma.

WILSON Giant draw works powered with 2 model 12103-HD GMC Twin Diesel Engines. Can be inspected while running. Phone 3-2806, Wichita, Kansas, or P. O. Box 497, Tulsa, Oklahoma.

WELL SERVICING UNITS — Skid type, Single Drum Cardwells, Wilsons, Allis-Chalmers, Muskogee, Keltner. Double & Single Pole Mast. Have Draw Works on long skids w/ 86' Double Pole Rotary Mast for shallow well rotary. For sizes & prices—Write General Tool & Supply Co., P. O. Box 4387, Oklahoma City.

for
VALVES • FLANGES • FITTINGS
it's
Newman's Inc.
"One of the Southwest's Leading Distributors"
Tulsa, Okla. P.O. Box 1865 Ph. 25228-LD 635

STEEL STORAGE TANKS

11—55,000 bbl. Tanks—114' 6" dia. x 30' high
10—80,000 bbl. Tanks—117' 6" dia. x 41' high

All tanks steel roof, riveted construction throughout. Standing location near Mexia, Texas, and suitable for re-erection. Detailed specs. and prices available on request.

SOUTHERN IRON & METAL CO.
Box 3270, Beaumont, Texas
MID-STATES PIPE & SUPPLY CO.
Box 2334, Tulsa, Okla.
ROGERS & WRIGHT, INC.
215 Wright Bldg., Tulsa, Okla.
HORWITZ PIPE & STEEL CO.
Box 1408, Oklahoma City, Okla.

EQUIPMENT FOR SALE

SPEED STAR 71 Serial #9390, Truck Mtd. Bargain for quick sale. Imed. Del. G. J. Stumpff, Box 1107, Goodyear, Ariz.

NEED a good 4500 foot draw works? Wilson Giant, Vacuum controlled, GM 12103 Twin Six Diesel, Pump drive, Friction catheads. Excellent running condition. Located Great Bend, Kansas. C. Spitzfaden, Box 2001, Wichita, Kansas. L. D. 128.

FORT WORTH Model-D Spudder complete with International Power Unit, tools for 22" diameter holes, $4,500.00. Located near Los Alamos, New Mexico. Inventory furnished upon request. Texas Water Wells, Inc., 951 McCarty Drive, Houston, Texas.

FOR SALE: Bethlehem Breeze Rig complete with twin GM Diesels; 96 foot Lee C. Moore mast; about 3500 ft. 4½" Drill Pipe; 7¼ x 14 Pump, measuring line, slips, subs, barrels, etc., complete ready to drill. Box 176, Salem, Illinois.

Gaso Duplex 4½" x 6" Power Pumps with Chrysler C-36 Engines, skid mounted, immediate delivery. Also Byron Jackson, Carter Centrifugal Units. Westinghouse 20-25-50 KW Generating Units.

H. H. COFFIELD
Attn.: W. H. ORR
Phones: 132—Rockdale, Texas
AT-3427—Houston, Texas

TANKS FOR SALE

Good as new, for immediate delivery. One 80,000 BBL. Seven Ring all steel tank for $35,000.00. Three 55,000 BBL. Five Ring all steel tanks for $17,500.00 each. As is where is and subject to prior sale. We will also cut down and re-erect as welded tanks either of the 55,000 BBL. tanks above for $38,500.00. Or we will cut down and re-erect the 80,000 BBL. as a welded tank for $50,250.00. These are rivited tanks and of standard construction and may be inspected now near Shreveport, La. Contact by mail or phone

We will trade any of the above tanks for Scrap iron.

CLYDE DAMPF, INC.
Box 2515, Amarillo, Texas. Phone 3-3050

TANKS FOR SALE

5—80,000 bbl. tanks riveted, shell and bottom only, cut down or standing, located at Norris City, Illinois.

1—80,000 bbl. tank, riveted, steel roof, cut down or standing, located at Udall, Kansas.

Priced to Sell.

BB&G OIL COMPANY

Phone 3-6141 **Tulsa, Oklahoma** **P. O. Box 1858**

EQUIPMENT FOR SALE

EQUIPMENT FOR SALE
Franks SAL-5000 rig. 2 NHS Cummins diesel engines. Franks rotary rig 96 feet. Jackknife derrick. Provided with pump drive. Good condition. Ready for immediate delivery. Box E-726, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE—Failing model 55, 3000′ capacity, truck mounted, 55′ mast. Box E-768, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: International LF212 RD450 Tandem winched rollered flat bed truck with tandem pole trailer; TD18 International Cat with winch and blade. Box 176, Salem, Illinois.

FOR SALE F.O.B. Pittsburgh, Pa.: Ten No. 1-2 Toby Gas meters, rated at three hundred feet an hour, all in No. 1 good condition. Wm. E. Stier, 153 Hinkel Road, Pittsburgh 29, Pa.

FOR SALE: One Model 36-L, Bucyrus-Erie, Type EB Spudder. Equipped with Buda L.O. 525 gas-gasoline engine, casing tackle strut, tool crane, cables, light plant, water tank, and complete tools for 12″, 10″, 8″, and 6″ hole. Price F.O.B. Princeton, Indiana and subject to prior sale $18,000.00. Randall-Zogg Supply Company, P.O. Box 3, Princeton, Indiana. Phone 802 or 219.

FOR SALE: One completely rebuilt, model 24-L, Type EB, Bucyrus-Erie Spudder. Equipped with Buda H.P. 326 engine, 40′ telescopic derrick, power derrick hoist, swabbing unit, catheads, and casing reel. Price F.O.B. Princeton, Indiana, and subject to prior sales $6,500.00. Randall-Zogg Supply Company, P.O. Box 3, Princeton, Indiana. Phones 802 or 219.

FOR SALE: Well Drilling Business—71 Star, Modernized #3 Keystone, Both Truck Mounted. Complete Tools, 4 to 20 inch. Physical Inventory $15,000. Nets $6,000 to $8,000 yearly. This is Industrial—No Pipe Worries. Sales Price: $11,000.00. Owner retiring. Write Box E-594, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Wilson Super Winch, Waukesha power, 8″ x 7″ pole, mounted on Ford truck, complete set rod and tubing tools. Cleaveland Well Service, P.O. Box 308, Tel. 446, Luling, Texas.

FOR SALE: Mayhew 2000 Core Drill with 145 HP Ford auxiliary motor, mounted on 6 x 6 G.M.C. truck, practically new, A1 condition. Lewis and Clemens Drilling Co., Princeton, Ind. Phone 706.

FOR SALE: Good 3½″ and 4½″ OD Drill pipe. Two EKU Waukesha's, One RL Cardwell, Hercules Engine, Tanks, Treaters, Pumping units. Rogers Pipe & Supply Co., 620 Wright Bldg., Tulsa, Oklahoma.

FOR SALE: Two truck-mounted Bettis steam generators; one 30 hp. on a '48 Ford C.O.E.; one 40 hp. on a '41 Chevrolet 4 by 4. Both units completely equipped. Also selling yard and building at Russell, Kansas. Going out of business. Dave Edmiston, Russell, Kans.

FOR SALE: 25 Gamma Magnet-o-meter, German Build. P.O. Box 1016, Wichita Falls, Texas.

ONE—45-C Star spudder with 10″ A Pole. 1—13 thousand diesel motor. 1—Koehler light plant. 15″ down to 5″ tools. Winter house, floor walks. Drilling lines, sand lines. All tools for running rig. 12″, 10″ and 8″ casing, all seamless pipe. These tools are running in good shape. Bad Health. Archie Newland, Yates Center, Kansas. Phone 232.

FOR SALE: 136′ Muskogee 800,000# API Capacity Steel Derrick, 9′ 1,000,000# Sub-Structure with lumber and timbers. Good shape, drilled only 7 wells, dismantled. $7,500.00 FOB location. Grady Forbes, 6-3552, Box 2649, Odessa, Tex.

FOR SALE at less than ceiling price, located in Houston, approximately 40,000 ft. of No. One 8⅝-in. O.D., 28.55 lb. used line pipe beveled for welding, perfectly clean inside and out. Subject to prior sale. South Texas Pipe & Supply Co., Box 3188, Corpus Christi, Tex.

FOR SALE: 12″ x 8¾ x 16″ Gumbo Buster Steam Pumps (2) in excellent condition with all fittings, a complete set up, for pumping water, Oil etc. Also 2000′ of 10¾″ and 6⅝″ O.D. line pipe. This plant recently closed down. Located Lake Charles, La. Contact owner, A. A. Gilbert Pipe & Supply Co., Shreveport, La. P.O. Box 986.

EQUIPMENT FOR SALE

PIPE
All sizes; line pipe and casing, tanks, and Oilfield supplies. Edco Pipe & Supply Co. Phone 45970, P.O. Box 151, Tulsa, Oklahoma.

WANT EQUIPMENT: Did you find the equipment you wish to purchase in this column? If not, use an "Equipment Wanted" classified advertisement to find it. It is available somewhere and Journal classified advertisements will find it. See box heading for classified rates, or write The Oil and Gas Journal.

EQUIPMENT WANTED

WANTED: Jackknife Derrick and Substructure. Prefer L. C. Moore 87′ or 94′. Will consider any good Jackknife. Contact Box 1022, Del Rio, Texas.

WILL PAY highest prices for used casing, used line pipe, abandoned leases, or other surplus lease equipment. Your idle producing equipment is worth dollars. Green Pipe & Supply Co., Box 1363, Tulsa, Oklahoma.

1,400 FEET or less 3½″ EUE or 2⅞″ EUE drill pipe, new or good used. One 30 foot 4¾″ drill collar, new or good used. Have PAD authorization for pipe. Box E-606, The Oil and Gas Journal, Tulsa, Oklahoma.

WE BUY well drilling equipment machines, cable tools, pipe, etc. Turn your surplus equipment into cash. Pressey & Son, Pueblo, Colorado.

WILL TRADE—600 joints of second-hand lapweld tubing at Garnett, Kansas, for 4½″ line pipe. Contact Huitt, Deep Rock Oil Corp., Tulsa, Oklahoma.

WANT to contact owner of Joy #350 or similar suitable rig for contracts several wells 3500′ to 5000′. Prefer deal with option to purchase. New territory. Address F. L. White, Malta, Montana.

WILL TRADE—6500′ of 9⅝″ 43.5# N-80 casing at Odessa, Texas, for 5½″ casing. Contact Huitt, Deep Rock Oil Corp., Tulsa, Oklahoma.

EQUIPMENT NOT IN USE: Did you find a buyer in this column for the equipment you have for sale? Someone wants it and an "Equipment For Sale" classified advertisement in the Journal will find a buyer. See box heading for classified rates or write The Oil and Gas Journal.

LOSS CORPORATION

Want drilling or oil producting corporation showing operating loss over $25,000; will pay cash. Airmail or wire details to

NORMAN D. FITZGERALD
1141 Butternut Street, Abilene, Texas

HELP WANTED

WANTED

Manufacturer Sales Agent. Plastic pipe manufacturer. Pipe used in oil and agricultural industries. Set-up distributors; liberal commission. Contact

Box E-764
THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

HELP WANTED

NOW READY: List showing where to apply for foreign oil jobs. Write for price. OIML Co., Box 2603, Tulsa, Okla.

PURCHASING AGENT

Major petroleum refinery and chemical plant construction company located in New York has excellent opportunity for outstanding Purchasing Agent with minimum 10 years' experience in refinery type of job purchasing. Please submit complete resume including past earnings record. Your reply is confidential.

Box E-776, The Oil and Gas Journal
Tulsa, Oklahoma

MUD TECHNICIANS

Major oil company in Venezuela has openings for experienced mud technicians. Age 25-40; 2 years college and specialized training. 1-3 years' experience. Approximate annual earnings $8330.

Write giving full details to:

GULF OIL CORP.
Foreign Prod. Div.
P.O. Box No. 35, New York 4, N. Y.

Chemical Plants Division
Blaw-Knox Construction Co.

Needs

Process Engineers
Piping Design Engineers
Mechanical specification Engineers
Planning and scheduling Engineers
For Tulsa Office

Electrical Engineers
For Tulsa and Pittsburgh, Pennsylvania Offices

Construction Field Accountants
For Assignment From Tulsa Office

Must Be Experienced in Refinery, Gasoline, Industrial and Chemical Plant Work

P. O. Box 1266 Tulsa, Okla.

OPPORTUNITIES FOR TECHNICAL REFINERY PERSONNEL for LARGE INTERNATIONAL OIL COMPANY

Entertaining applications of graduate chemical, mechanical, structural and electrical engineers for refinery engineering assignments at home and abroad.
Engineers with refinery experience and also recent graduates will be considered.

Box E-667, The Oil and Gas Journal, Tulsa, Oklahoma

HELP WANTED

GEOPHYSICIST: Moderately sized company with active exploration program desires geophysicist. This company presently conducting geophysical program with contract geophysicist but is planning on Geophysical Department. Only applicants under 35 years and with sufficient training and experience to act as supervisors considered. Prefer men with major company experience. Permanent location at company headquarters. Write giving experience and training in detail, and salary desired. Box E-766, The Oil and Gas Journal, Tulsa, Oklahoma.

RESERVOIR ENGINEER with over 5 years' experience, including field training. Independent California operator. Box E-748, The Oil and Gas Journal, Tulsa, Oklahoma.

OIL Industry Employment Service, 405 Tuloma Building, Tulsa, Okla. 4-5974. Tom Robinson, owner. For Technically trained personnel. No fees. Confidential.

WANTED: Experienced Fluid Catalytic Cracking Operator to become supervisor of Cat Cracking and to assist superintendent. Location New Orleans. Technical man preferred. Give education, past employment and salary expected. Box E-754, The Oil and Gas Journal, Tulsa, Okla.

EXPERIENCED engineer capable of designing and servicing Wellhead equipment such as separators, treaters, heaters and attendant equipment handling crude oil to storage. Location Tulsa area with progressive steel plate fabricator. Box E-752, The Oil and Gas Journal, Tulsa, Oklahoma.

KEY Seismograph Personnel Needed by Established and Expanding Seismograph Company. Box E-618, The Oil and Gas Journal, Tulsa, Oklahoma.

RAPIDLY expanding Company wants College graduate for Oil Country sales job. Must be between 27 & 35 years of age. Write stating qualifications and present position. All replies confidential. Box E-735, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED — SEISMOGRAPH PARTY CHIEF. Must be fully qualified. Age 27-38. A good opportunity for the right man. Box E-770, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Experienced Reservoir Engineer by independent company. Individual must know well workover procedure and be capable of making recommendations toward maintaining an optimum reservoir cycling program already in progress Box E-780, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: A drilling and production superintendent for gas company owning approximately 50 wells in north and south Louisiana. The man should be capable of handling workovers, drilling and general production problems of the gas wells. Prefer man in early thirties. He would locate at present in north Louisiana. Box E-781, The Oil and Gas Journal, Tulsa, Oklahoma.

THE POSITION YOU WANT: Oil industry companies are looking for men to fill every conceivable kind of position. If you didn't find the position in this column that you are looking for, use a "Situation Wanted" classified advertisement to state your qualifications. Some company is probably looking for your ability. See box heading for classified rates or write The Oil and Gas Journal.

SENIOR
PETROLEUM ENGINEER

Major oil company has opening for senior petroleum engineer in Middle East producing operations. Degree in Petroleum Engineering and not less than eight years experience including some experience with Sand Reservoirs essential. Write giving full details of experience and salary expected.

P.O. Box 35
Bowling Green Station
New York 4, N. Y.

SITUATIONS WANTED

ATTENTION: Well established oil well drilling contractor desires to manage and supervise: Individuals', groups', small or medium-sized oil companies' drilling, production and operating problems in Central and Western Texas, and New Mexico. Personal interview by appointment is desired. Makin Drilling Company, Box No. 1628. Ph. No. 131, Hobbs, New Mexico.

PETROLEUM Production Engineer with 15 yrs. experience in drilling, completion, work-over, production work and supervision of production and engineering departments. Presently employed, desires change to a progressive company with future. Reply Box E-756, The Oil and Gas Journal, Tulsa, Okla.

SUBSURFACE GEOLOGIST—8 years major company exploration experience. Desires change. Excellent references. Box E-773, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE petroleum engineer, 29, married, three years intensive experience includes drilling, completing, producing, and reworking oil and gas distillate wells, and collecting and keeping engineering data and records, desires position with good possibilities for advancement. Independent or company. Box E-763, The Oil and Gas Journal, Tulsa, Okla.

PRODUCTION SUPERINTENDENT. Graduate Petroleum Engineer. 12 years responsible experience producing industry. Geological ability. Mid-Continent or Rocky Mountains. Box E-774, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST, Age 26, B.S. Degree, Married, Veteran. Two years experience drilling and production in West Texas. Now employed at substantial salary, prefer job with sound future with substantial Independent. Will consider Rocky Mountain or Williston Basin move. Box E-785, The Oil and Gas Journal, Tulsa, Oklahoma.

AGE 36, seventeen years experience with major, independent, and drilling contractor as petroleum engineer, production superintendent, drilling superintendent, and general manager. Exceptional experience and acquaintance. Presently engaged in consulting work. Excellent references. Box E-786, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOPHYSICIST—Geologist — Geochemist, Consulting—Land and leasework. Twenty years experience in field operation and data interpretation. Desires full or part time employment in Illinois Basin. Now resident of Mattoon, Illinois. C. G. Rosaire, Box 352, Mattoon, Illinois.

GRADUATE Lawyer with 15 years' experience in land and title work, legal investigations, oil and gas lease buying, deal and contract analysis in Mid-Continent area, desires change in order to procure position with right to make royalty play for himself. For references and further information write Box E-782, The Oil and Gas Journal, Tulsa, Oklahoma.

TANK CAR man thoroughly experienced, operation also maintenance, and field work. Good connections. Box E-784, The Oil and Gas Journal, Tulsa, Oklahoma.

THE RIGHT MAN: Can you fill the position you have open from the qualifications listed in this column? Men are always looking for an opportunity to improve themselves. Use a "Help Wanted" Journal classified advertisement to find the men you need. See box heading for classified rates or write The Oil and Gas Journal.

REAL ESTATE

INDUSTRIAL LAND

FOR SALE: 10.8 acres high land in Edmonton, Alta., Canada (Canada's oil capital) served with gas, power, paved road, railway trackage. 8311—76 Ave., Phone 34445, Edmonton, Alberta, Canada.

SPACE IS NEEDED: A Journal display classified advertisement is the quickest way to rent or sell your real estate. In the present period of expansion oil industry firms urgently need the space you have available. If it isn't listed here, you may also find it by stating your needs in these pages. For classified rates see box heading or write The Oil and Gas Journal.

ROYALTIES

WILLISTON MINERALS
Send for list. Can offer Williston Basin minerals for $10 per acre with $1.00 annual rentals. Can sell in minimum tracts of 40 acres. Solicit sales only to those connected with oil or royalty business. References exchanged. Write or call Milburn & Milburn, Sewell Building, Telephone 6-6439, Odessa, Texas.

WILLISTON BASIN ROYALTIES
Dealers in Montana royalties since 1921, we now specialize in royalties under major company leases in the Montana portion of the Williston Basin. For information on our method of operation, write LANDOWNERS ROYALTIES COMPANY, Box 1225, Great Falls, Montana.

GET TOGETHER: Both Capital and Royalties are available. If the investment proposition you want isn't listed in this column, use a Journal classified advertisement to find it. See box heading for classified rates, or write The Oil and Gas Journal.

LEASE AND DRILLING BLOCKS

WILL consider selling interest large block oil leases Montana. Also consider drilling commitment. Box E-783, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE or Farm Out on Drilling Contract. 8000 acres in Trigg County, Kentucky. Located both south and west of Big Trigg Fault. C. P. Taneyhill, P. O. Box 304, Bowling Green, Ky.

FOR LEASE on ⅛ basis 100,000 acres by owner. Located on Cumberland plateau. (Tennessee's coal basin). Both oil and gas now being produced at shallow depths from adjoining acreage. Box E-617, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: One-half interest in 360 acre farm, Meade County, Ky. Five wells, 8 bbls. daily. No dry holes. Wells never acidized. $7500.00. Geo. Baker, Utica, Ky., RR2.

WE invite inquiries from persons interested in Oil and Gas Leases in Southern Alberta, North Central Montana and the Williston Basin. Box E-664, The Oil and Gas Journal, Tulsa, Oklahoma.

WILL pay cash instantly for leases (large blocks), royalties, mineral deeds, production. Write fully—P. O. Box 2153, Denver, Colorado.

SKIRTING production north we are offering 10,000 choice acres in Cimarron County, Oklahoma, at a fair price. Box 1106, Amarillo, Texas.

LOOKING FOR A LEASE? There will be over 40,000 wells drilled this year. If you are looking for a lease, drilling block, or drilling deal and haven't found it in this column, or if you have a lease or drilling block you want drilled, a Journal classified advertisement can find an interested party. See box heading for classified rates, or write The Oil and Gas Journal.

OIL AND GAS LEASES FOR SALE

The following State and Federal leases for sale on a bonus and over-riding royalty basis:

Rio Arriba Co., New Mexico:
SW¼ of NE¼ of Sec. 36 T32N R1W

San Juan Co., New Mexico:
NW¼ of SE¼ of Sec. 2 T11N R10W
NW¼ of NW¼ of Sec. 12 T11N R11W
NW¼ of NE¼ of Sec. 2 T30N R14W
S½ of Sec. 11 T24N R12W

DR. R. LUCIAN HAMILTON
1212 F St. Marysville, California

NORTHWESTERN NORTH DAKOTA LEASES AND MINERALS

Our latest lists with prices, mailed on request. Will also buy acreage where you want it. Any place in Northwestern North Dakota. References exchanged.

BORSTAD & FITZMAURICE
Oil Properties
4th Floor 1st National Bank Bldg.
Phone 40-226 Minot, North Dakota

LEASE AND DRILLING BLOCKS

POTENTIAL OILFIELDS
ROOSEVELT CO., N. M., Sec. 36-2S-30E. Well ready drill testing Permian oil sands within ½ mile indicated flowing well. Royalty under Major Co. lease 1 mile of well. DEBACCA CO., N. M., Sec. 33-3S-29E. Royalty in Major Co. block near proposed deep test. Data on request.
W. J. PETERMAN, GEOLOGIST
Portales, New Mexico

PRODUCTION WANTED
Principals interested in purchasing operating producing properties in Mid-Continent Area.
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Central Area

(Continued from page 261)

N. Allen 2 Fischer, SW SW NW 23-3s-9w, dry, TD 1,787 ft.
Ashland Oil & Refining Co. et al 1 Hudelson, NE NE NW 36-2s-13w, dry, TD 2,800 ft.
Fountain County: E. A. Riggs 1 Allridge, SW SW NW 4-18n-8w, dry, TD 981 ft.
Pike County: Sturgeon et al 1 Willis, NE SE NE 19-1s-8w, dry, TD 1,563 ft.
Posey County: Ralph Halbert 1 Garrett, 330 ft. from NL and 990 ft. from WL Fractional Section 5-4s-12w, dry, TD 2,402 ft.
Vigo County: T. & H. Corp. 1 Reclor, NW SE NE 36-11n-8w, dry, TD 1,730 ft.

WESTERN KENTUCKY WILDCAT FAILURES

Christian County: Olds Oil Co. 1 Barnett, SEc NE SE SE 18-H-23, dry, TD 1,497 ft.
Daviess County: W. F. Lacy 1 Rice, SE SW NW 22-Q-27, dry, TD 1,973 ft.
Grayson County: G. E. Winn 1 Kennison, NWc NE NW SE 2-L-27, dry, TD 1,197 ft.
Henderson County: Skiles Oil Corp. 1 Shivley Hart, W½ SW NE NE 1-N-23, dry, TD 2,698 ft.
Skiles Oil Corp. 1 Dixon, NE SE SE 2-O-22, dry, TD 2,296 ft.
F. M. Ashby 1 Hazelwood, NWc NW SE SW 14-P-27, dry, TD 2,035 ft.

MICHIGAN SUCCESSFUL WILDCAT

Ogemaw County, Foster Township: Brazos Oil & Gas Co. BBB-5 State-Foster, N½ NW SE 21-24n-1e, 226 bbl. of oil from Richfield, flowing through ½-in. choke after 2,000 gal. acid treatment, TD 4,294 ft. Major extension of Rose City oil pool.

MICHIGAN WILDCAT FAILURES

Allegan County, Dorr Township: Ford Oil Co. 1 Fritza, SW SW SW 28-4n-12w, Traverse 1,628 ft., dry, TD 1,638 ft.
Health Township: P. K. Degenther E-1, U.S.A., SE NE NW 26-3n-14w, Traverse 1,450 ft., dry, TD 1,500 ft.

Southwest Texas

(Continued from page 261)

McMullen County: Anderson-Prichard Corp. 1-C Shiner Ranch-Huff, Shumway Subd. of Shiner Ranch, Sec. 27, Henry M. Brewer Sur., A-69, dry, TD 2,020 ft.
Nueces County: Tri-Mark Oil Co. 1 Jean H. Cyrus et al, Laureles Farm Tracts, Blk. 52, dry, TD 6,515 ft.
San Patricio County: Holly Development Co. 1 Rand Morgan, Sec. 29, Fourth Addn. to Taft Farm Lands, dry, TD 8,520 ft.
Starr County: Sun Oil Co. 19 B. G. de Garcia, Porcion 98, Share 5, dry, TD 4,505 ft.
Val Verde County: Petrocel Corp. 1 Bluff Creek Ranch, Sec. 37, Blk. 4, I&GN RR Co. Sur., dry, TD 1,974 ft.
Webb County: Dulaney Oil Co. et al 2 A. M. Bruni Est., Sur. 597, dry, TD 1,157 ft. Hawn Bros. 1 Mabel Adami, BS&F Sur., A-926, Sec. 15, Share 4, dry, TD 1,025 ft.
Zapata County: O. W. Killam 1 J. M. Sanchez, Saucito Pasture Corralitos Subd. Jose V. Borrego Grant, Share 4, dry, TD 2,475 ft.

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Kansas Fields

(Continued from page 253)

Kansas City 3,495-3,500 ft., TD 3,696 ft., PBTD 3,520 ft. (opens Hudson pool).

KANSAS WILDCAT FAILURES

Butler County: Wilson 1 Wilson, NE NW SE 15-25s-4e, dry, TD 3,022 ft.

C. A. Brock-NCRA 1 Frakes, NW NW NW 14-29s-6e, dry, TD 2,817 ft.

Clark County: Flynn 1 Abril, SE NE SE 27-32s-23w, dry, TD 5,445 ft.

Cowley County: Gross Drilling Co. 1 Dillow, SW SW NW 27-34s-3e, dry, TD 3,413 ft.

Morrison Drilling Co. et al 1 Mounts, NW NE SW 12-35s-3e, dry, TD 3,450 ft.

Ellis County: Keystone 1 Lee, SE SE NE 25-14s-20w, dry, TD 3,842 ft.

Greenwood County: E. E. Sauder 1 Sayllards, SE SE SE 27-25s-9e, dry, TD 2,278 ft.

Norton County: Brooks Hall-Strain Drilling Co. 1 Voss, NE NE SW 29-5s-21w, dry, TD 3,771 ft.

Rice County: Lohman & Johnson 1 Maes, NE NE NW 2-18s-10w, dry, TD 3,322 ft.

Rooks County: Lewis Drilling Co. 1 Kemmler, NW NW SE 7-6s-17w, dry TD 3,550 ft.

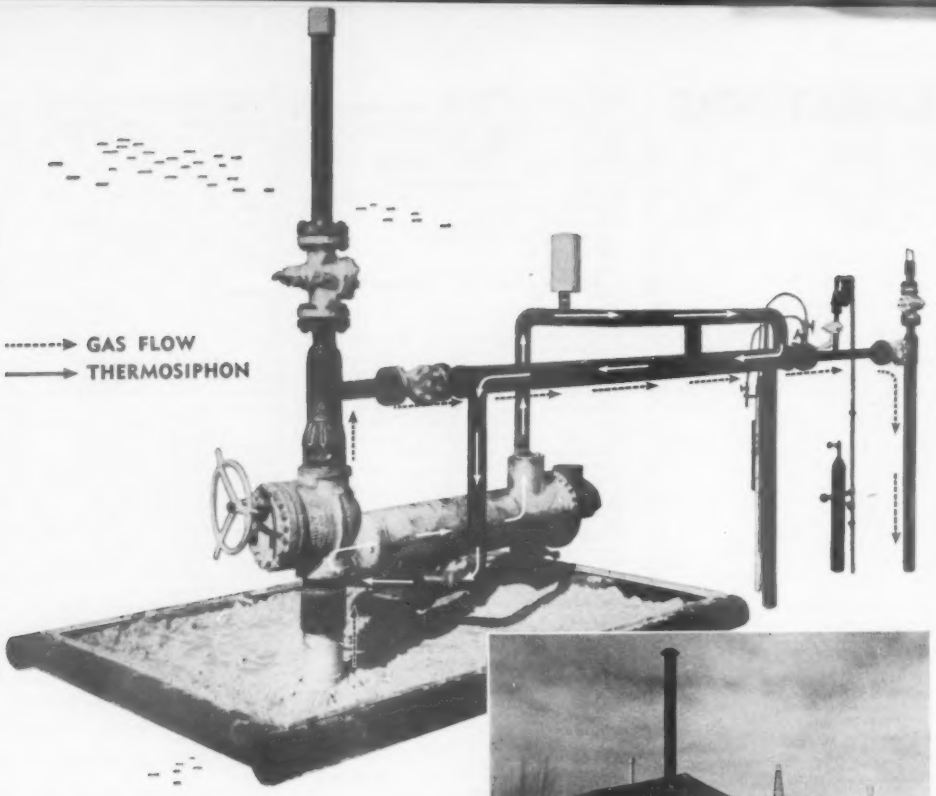
Petroleum, Inc., 1 O'Brien, SW SE SE 5-9s-18w, dry, TD 3,516 ft.

Russell County: Brunson-NCRA 1 Aley, NW NW NW 6-15s-15w, dry, TD 3,460 ft.

Sedgwick County: Sunray Oil Corp. 1 Farber, SW SW NE 29-29s-2e, dry, TD 3,585 ft.

LEGAL

Sealed bids for oil and gas mining leases on certain trust lands on the Crow Indian Reservation, Big Horn and Yellowstone Counties, State of Montana, will be received at the Office of the Superintendent, Crow Indian Agency, Crow Agency, Montana, up to 2:00 o'clock P. M., Montana Standard Time, June 6, 1952. For further information, call or write L. C. Lippert, Superintendent, Crow Indian Agency, Crow Agency, Montana.



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